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ABSTRACT

Broad national goals, expressed as reductions in overall death rates or days of disability, have been established as guidelines for private and public sector policy makers in health-related fields. These goals were established through the work of various agencies, organizations, and individuals participating in a Department of Health and Human Services effort. Health priority areas have been set for five major life stages: infancy, childhood, adolescence, adulthood, and old age. This volume sets out specific and quantifiable objectives for the attainment of these goals. Objectives are established for controlling and promoting understanding of: (1) high blood pressure; (2) family planning; (3) pregnancy and infant health; (4) immunization; (5) sexually transmitted diseases; (6) fluoridation and dental health; (7) surveillance and control of infectious diseases; (8) smoking; (9) misuse of alcohol and drugs; (10) physical fitness and exercise; (11) control of stress and violent behavior; (12) toxic agents; (13) occupational safety and health; (14) accident prevention and injury; and (15) nutrition. In discussing each of these subjects, the nature and status of the problem is set forth. Prevention and control measures and specific objectives for 1990 are considered, and the principal assumptions that underlie the framing of the objectives are outlined. The data necessary for tracking progress at the national and local levels are listed. (JD)

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OBJECTIVES FOR THE NATION

Fall 1980

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service

SP 019 022

Department of Health and Human Services
Patricia Roberts Harris, Secretary

Public Health Service
Julius B. Richmond, M.D., Assistant Secretary
for Health and Surgeon General

Office of Disease Prevention and Health Promotion
J. Michael McGinnis, M.D., Deputy Assistant Secretary
for Health

Center for Disease Control
William H. Foege, M.D., Director

Health Resources Administration
Henry A. Foley, Ph.D., Administrator

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DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Office of the Assistant Secretary
for Health
Washington DC 20201

I am pleased to share with you Promoting Health/Preventing Disease: Objectives for the Nation. Our national strategy for achieving further improvements in the health of Americans was established in Healthy People, a document that notes our accomplishments in prevention, identifies the major health problems, and sets national goals for reducing death and disability. This volume sets out specific and measurable objectives for fifteen priority areas that are key to achieving our national health aspirations. We appreciate the work of so many people to define quantifiable objectives against which we can assess the effectiveness of our efforts.

Achievement of these objectives by 1990 is a shared responsibility, requiring a concerted effort not only by the health community, but also by leaders in education, industry, labor, community organizations and many others. These challenges for the eighties demand creative approaches and by working together we can realize our aspirations and really make a difference.

Julius B. Richmond

Julius B. Richmond, M.D.
Assistant Secretary for Health
and Surgeon General

CONTENTS

page

INTRODUCTION AND OVERVIEW 1

PREVENTIVE HEALTH SERVICES

HIGH BLOOD PRESSURE CONTROL . 5
  Specific Objectives 7
FAMILY PLANNING 11
  Specific Objectives 13
PREGNANCY AND INFANT HEALTH . 15
  Specific Objectives 17
IMMUNIZATION 21
  Specific Objectives 22
SEXUALLY TRANSMITTED DISEASES 25
  Specific Objectives 26

HEALTH PROTECTION

TOXIC AGENT CONTROL 31
  Specific Objectives 34
OCCUPATIONAL SAFETY AND HEALTH 39
  Specific Objectives 41
ACCIDENT PREVENTION AND INJURY CONTROL 45
  Specific Objectives 47

page

FLUORIDATION AND DENTAL HEALTH 51
  Specific Objectives 54
SURVEILLANCE AND CONTROL OF INFECTIOUS DISEASES 57
  Specific Objectives 58

HEALTH PROMOTION

SMOKING AND HEALTH 61
  Specific Objectives 63
MISUSE OF ALCOHOL AND DRUGS . 67
  Specific Objectives 69
NUTRITION 73
  Specific Objectives 75
PHYSICAL FITNESS AND EXERCISE . 79
  Specific Objectives 80
CONTROL OF STRESS AND VIOLENT BEHAVIOR 83
  Specific Objectives 85
ACKNOWLEDGEMENTS 87

INTRODUCTION AND OVERVIEW

The Purpose and the Process

In 1979 the first Surgeon General's Report on Health Promotion and Disease Prevention, *Healthy People,* was issued. That report chronicled a century of dramatic gains in the health of the American people, reviewed present preventable threats to health, and identified fifteen priority areas in which, with appropriate actions, further gains can be expected over the decade. The report established broad National goals—expressed as reductions in overall death rates or days of disability—for the improvement of the health of Americans at the five major life stages. Specifically, the goals established were:

- To continue to improve infant health, and, by 1990, to reduce infant mortality by at least 35 percent, to fewer than nine deaths per 1,000 live births.
- To improve child health, foster optimal childhood development, and, by 1990, reduce deaths among children ages one to 14 years by at least 20 percent, to fewer than 34 per 100,000.
- To improve the health and health habits of adolescents and young adults, and, by 1990, to reduce deaths among people ages 15 to 24 by at least 20 percent, to fewer than 93 per 100,000.
- To improve the health of adults, and, by 1990, to reduce deaths among people ages 25 to 64 by at least 25 percent, to fewer than 400 per 100,000.
- To improve the health and quality of life for older adults and, by 1990, to reduce the average annual number of days of restricted activity due to acute and chronic conditions by 20 percent, to fewer than 30 days per year for people aged 65 and older.

This volume, *Promoting Health/Preventing Disease*, sets out some specific and quantifiable objectives necessary for the attainment of these broad goals. Objectives are established for each of the 15 priority areas identified in the Surgeon General's report: high blood pressure control; family planning; pregnancy and infant health; immunization; sexually transmitted diseases; toxic agent control; occupational safety and health; accident prevention and injury control; fluoridation and dental health; surveillance and control of infectious diseases; smoking and health; misuse of alcohol and drugs; physical fitness and exercise; and control of stress and violent behavior. A number of different objectives are specified for each of the 15 areas. Taken together the targets established in *Promoting Health/Preventing Disease*, when attained, should permit the realization of the overall National goals set down in the Surgeon General's report.

The objectives are the result of a year long effort involving more than 500 individuals and organizations from both the private and governmental sectors. First drafts were drawn up by 167 invited experts at a conference held in Atlanta, Georgia, on June 13 and 14, 1979, sponsored by the then Department of Health, Education, and Welfare. The conference, organized into work groups for the 15 subject areas, was a joint effort of the Center for Disease Control and the Health Resources Administration, coordinated by the Office of Disease Prevention and Health Promotion of the Office of the Assistant Secretary for Health.

An invitation for public comment on these drafts was published in the *Federal Register* and the volume containing them was also circulated widely to people and agencies concerned with the various subjects. During the fall of 1979 the objectives and reports were revised according to the suggestions received. In early 1980 the revised objectives were circulated within the Department of Health and Human Services, to other relevant Federal agencies, and to Atlanta conference work group chairpersons to elicit further comment. Final revisions were made in the spring of 1980.

Because the process received such a substantial contribution from the 1979 Atlanta conference, it merits special note. The conference participants and invited observers were all knowledgeable about some aspect of risk reducing actions that can improve the opportunities for health. The chairpersons and members of each of the 15 work groups were expressly selected to provide a mix of backgrounds which could bring to the task not only technical expertise and consumer and professional viewpoints, but also practical experience with planning and program implementation. Thus, participants were drawn from a variety of affiliations—providers, academic centers, State and local health agencies, voluntary health associations, and many others.

To facilitate the discussions, each work group member received a draft background paper, prepared by staff of an HEW office with program responsibility in the relevant prevention activity. Other HEW activities in setting goals and standards for prevention were taken into account both in the background papers and in work group discussions, particularly the National Health Planning Goals called for by Section 1501 of P.L. 93–641, presently under development by the Health Resources Administration, and the Model Standards for Community Preventive Health Services called for by Section 314 of P.L. 95–83, whose development was coordinated by the Center for Disease Control.*

While the objectives were developed under Public Health Service sponsorship, and are consistent with Federal policies, they are far wider in purpose and scope. They are intended to be National—not Federal—objectives. To realize the potential for reducing the rates of premature death and disability to the levels set forth here requires a truly National commitment, including, but going far beyond, that of government.

To achieve these objectives demands actions by Americans in all walks of life, in their roles as concerned individuals, parents, and as citizens of their Nation and of States and local communities. Sustained interest and action is required not only by physicians and other health professionals, but also by industry and labor, by voluntary health associations, schools, churches, and consumer groups, by health planners, and by legislators and public officials in health departments and in other agencies of local and State governments and at the Federal level.

While the diagnosis and treatment of disease are the primary responsibility of health professionals and health organizations, actions to reduce the risks of disease or injury extend far beyond health services *per se*. The range of preventive activities is broad. Included are key preventive services, such as immunization, delivered to individuals by physicians, nurses, other health professionals, and trained allied health workers. Also important are standards, voluntary agreements, laws and regulations, such as engineering standards, safety regulations and toxic agent control, to protect people from hazards to health in their living, travel and working environments. In addition, and perhaps most important for today's health threats, there are activities that individuals may take voluntarily to promote healthier habits of living and activities that employers and communities may take to encourage them.

This document is designed for the use of leadership in the wide range of private and public sector organizations with important roles in these various areas. At a time in the Nation's history when budgets become ever tighter, legislators, public officials and governing boards of industry, foundations, universities and voluntary agencies are beginning to re-examine their traditional bases for allocating their limited health-related resources. It is anticipated that in the years to come policy makers will be able to use the objectives in this volume to track the Nation's successes or failures in prevention.

The Reports

Each of the reports focuses on one of the 15 prevention areas and is presented in a standard format allowing a review of:

- the nature and extent of the problem, including health implications, status and trends;
- prevention/promotion measures illustrative of approaches in education and information, services, technology, legislation and regulation, and economic incentives, followed by observations on the relative strength of these measures;
- specific national objectives for:
  - improved health status
  - reduced risk factors
  - improved public/professional awareness
  - improved services/protection
  - improved surveillance/evaluation;
- the principal assumptions that underlie the framing of the objectives;
- the data necessary for tracking progress.

Discussion of the objectives is limited to some extent by the need to distill often comprehensive and complex issues into a short outline form as well as by limitations in the knowledge base. In some instances, for example, it is not possible to relate the magnitude of a targeted problem to a specific disease incidence—e.g., the prevalence of a particular carcinogen in the environment to an identifiable level of cancer incidence. Also, the discussions of the various intervention measures are offered principally as checklists rather than as detailed blueprints with appropriate sequencing carefully established and presented. They do not necessarily reflect Federal policy—rather they represent a broader range of possible measures available throughout the public and private sectors.

But these limitations are dictated by the character of the existing data, as well as the necessity to tailor efforts to local conditions. Given these considerations, the discussions provide a concise review of the central issues relevant to each area.

With respect to the objectives themselves, certain premises are inherent. First, the stated objectives should reflect a careful balancing of potentials for benefits and harm to the individuals or populations concerned. Second, specific actions suggested should be in line with professional consensus on likely efficacy of the action. Third, continued biomedical, epidemiological and behavioral science research, and systematic evaluation will result in improved judgments.

The objectives focus on interactions and supports designed primarily for well people; to reduce their risks of becoming ill or injured at some future date. Thus, few of the objectives deal with secondary prevention. Objectives relating to the frequency and content of physical examinations and other means of detecting early conditions (such as cervical, breast and colon cancer, diabetes, vision and hearing problems and dental caries) were deliberately excluded from consideration, despite their obvious importance in signaling needs for intervention.

Finally, an attempt has been made to confine objectives to what might feasibly be attained during the coming decade, assuming neither major breakthroughs in prevention technology, nor massive infusions of new Federal spending. For example, the goal for infant health is to reduce the infant mortality rate to no more than 9 deaths per 1,000 live births. In theory the Nation should be able to do much better. Several areas in western Europe, and certain political jurisdictions within the United States

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*Readers who want to place disease prevention priorities in the perspective of overall national health policy should refer to the draft *National Health Planning Goals*, forthcoming from the Health Resources Administration which address broad health status and health system considerations. Readers who want more specifics on how to put prevention measures to work are referred to *Model Standards for Community Preventive Health Services*, issued in 1979 by the Center for Disease Control.

already have achieved rates of 5 per 1,000. Yet, the size of the gaps that presently exist between the risks experienced by pregnant women in different age, ethnic and income groups of the population, and the limited resources that now appear likely to become available to narrow those gaps make 9 per 1,000 a more realistic objective.

In sum, the objectives were framed in the context of current knowledge and the current aggregate level of public and private resources for the 15 prevention areas. While this parameter was not adhered to in every instance, it promoted a greater measure of restraint—or realism—on the process.

No effort has been made to establish priorities among the 15 areas, or even among the various objectives within any given area. Given the nature of our pluralistic society and the diversity of regional and local needs and capabilities, both the setting of priorities and the choice of program direction are best left to those responsible for planning, coordinating, and implementing prevention strategies—namely State and local health agencies, State health planning and development agencies, health system agencies, and governing boards of the wide range of private sector organizations involved.

It is important to note that some themes can be identified which group the activities of the 15 areas into subcategories with common elements. "Substance abuse," for example, links the areas of smoking and health and misuse of alcohol and drugs. Common elements in these areas include questions of addictive properties, neurochemical action, long-term sequelae, age-related vulnerability, effectiveness of primary and secondary prevention measures, and ethical issues attendant to behavior change. Each of these issues should be considered not only on its own merit, but also for its lessons for, and commonalities with, the other abusive behaviors. Another example is the theme of "reproductive health." Family planning, pregnancy and infant health, and sexually transmitted diseases are, of course, all concerned with reproductive health, but elements are also found in the discussions of smoking and health, misuse of alcohol and drugs, nutrition, toxic agent control, occupational safety and health, and immunization. Approaches to ensuring positive results of human reproductive processes compel consideration of issues of sexual attitudes and behavior, understanding of fertility and infertility, decisions about pregnancy, activities and exposures during pregnancy, obstetrical services, and follow-up care of mother and infant. All are important factors in reproduction; central concerns of much of reproductive life. Considering the spectrum of issues in the aggregate, rather than a series of isolated events, has substantial merit.

Because such collective themes can be important to the implementation of measures to address the identified objectives, program directors designing such measures and setting priorities should search for the common elements particularly germane to their program needs and resources.

Crosscutting Issues

A number of issues are common to most or all of the reports: the problem of developing objectives in the face of economic uncertainties, a rapidly changing science base, the needs for more research and data, unpredictable shifts in popular interests and values, trade-offs between health and other societal interests, and ethical considerations in attempts to influence changes in people's customary habits. Two are discussed below: data requirements and research needs.

- **Data requirements**—The most salient common feature across the 15 areas is the need for better data both to profile current status and to track progress towards the established objectives. Statistical analyses derived from reliable data, continuously reported and coded according to universally accepted definitions and conventions, are the *sine qua non* for establishing the true nature of the problems preventive measures should address, as well as for charting trends towards achieving the objectives. There is currently great variability in the depth and reliability of data available among the 15 areas. While statistical reports relevant to the problem of smoking are quite complete, virtually no data exist to estimate the problem of unmanaged stress in the population, and its association with mental illness, cardiovascular disease or violent behavior.

  In some cases, the availability of baseline data and ability to track progress have been relatively more prominent than overall importance to health in shaping the nature of objectives. The paucity of data is particularly handicapping for State and local organizations and agencies seeking to set and track progress toward their own local priorities and objectives for prevention. For the most part, birth and death statistics and local hospital discharge abstract analyses remain their only guides. Results from the continuing National surveys, such as the Health Interview Survey (HIS) and the Health and Nutrition Examination Survey (HANES), while essential for tracking change in the United States population as a whole, are based on samples too small to permit analysis applicable to small areas.

  Surveillance systems developed to monitor the occurrence of infectious diseases provide models for many of the specific objectives relating to the prevention of other types of diseases and injuries. They depend on systems through which the occurrence of the particular condition or action will be reported within some ascertainable limits of accuracy and completeness. Whatever the source of the necessary data—physicians, hospitals, highway patrols, or insurance claim systems—important issues concerning the quality of the data must be addressed. Using data from surveillance systems which are not based on probability sample designs, or which are based on voluntary reporting, carries risks in making National estimates for tracking objectives. The level of voluntary reporting may differ markedly from one local area to another and fluctuates unpredictably at different points in time.

  Scientific evaluation of the impact of risk reduction on trends in health status or in reduction of risk factors is difficult methodologically and collection of the data required is expensive. To obtain valid results, test and control populations of considerable size must be followed over considerable periods of time, and a multiplicity of variables must be systematically taken into account.

We anticipate considerable improvements will be made in our data capabilities over the next decade. New methods now being developed will help State health planning agencies, health systems agencies and health departments use existing data more effectively to establish base lines of prevention needs and opportunities. New efforts are underway to target new subjects for National data collection efforts. By 1990 the Nation should have a considerably improved data collection network and therefore be able to assess the progress with greater reliability as well as to establish new priorities based on new knowledge.

- **Research needs**—The development of realistic objectives for risk reduction obviously must take place within the framework of whatever scientific knowledge is currently available. Since for most areas the state of the art is constantly changing, developing objectives for a point in time ten years down the road often means shooting at a moving target. For example, when the initial section on high blood pressure was drafted in June 1979, uncertainty about the efficacy of intervention in cases where blood pressure was only slightly elevated (90 to 104 mm Hg diastolic blood pressure without complications) led the work group to caution that in such cases: ". . . intervention . . . is not yet of clearly proven benefit." Ten months later, based on the results of a National study sponsored by the National Heart, Lung and Blood Institute, the statement was revised to read: "Based on 1979 research results, intervention seems warranted in a large proportion of this population."

If the objectives developed are to be refined and improved, the continuing need for basic biomedical research in most of the 15 subject areas of prevention is clear. Were our understanding of biological processes sufficient to develop vaccines to protect individuals against the most prevalent sexually transmitted diseases, tremendous opportunities for prevention would unfold and the task would become much easier. Similarly, epidemiological and biomedical research to identify major health risks from exposures to toxic agents is fundamentally important. We need new technologies to aid prevention in many areas—the development of acceptable, reversible, male contraceptives, for instance. Many of these issues have been addressed in the process of establishing National research principles, directed by the National Institutes of Health.

Additionally, behavioral research is needed to learn the basis for such addictions as smoking, overeating, and dependence on alcohol and drugs. Research at the interface between biomedical and behavioral methodologies is required to advance our knowledge of the effects of stress on health, and of how to control them.

Social science research is needed to find more effective ways to communicate to vulnerable and inaccessible populations, such prevention techniques as lifestyle change measures to reduce their percentage of low birth weight, high risk infants. Health services research is required to learn how to maintain adherence to health promotion measures over long time periods, such as high blood pressure control regimens and maintaining a balance between energy input from food and output from exercise. Cost effectiveness studies, too, could identify preferred measures in some areas of prevention, despite the difficulties already noted in defining the associated costs and benefits that limit the applicability of such analysis to many prevention activities.

Finally, legal and public policy research is called for in many areas of prevention, so that questions of individual and collective rights and responsibilities, and of trade-offs between economic and health values, and of short run versus long run benefits can be systematically introduced into public debates.

Implementation

Implementation of the objectives for each of the 15 areas requires a pluralistic process involving public and private participants from many sectors and backgrounds. Health officials and health providers must be joined by employers, labor unions, community leaders, school teachers, communications executives, architects and engineers, and many others in efforts to prevent disease and promote health. It is important to emphasize that, while the Federal Government must bear responsibility for leading, catalyzing and providing strategic support for these activities, the effort must be collective and it must have local roots.

Accordingly, the objectives contained in this volume must be viewed dynamically. They ought not to be considered rigid obligations, but as useful National guideposts—to be altered to fit local conditions, or as our level of understanding of the problems at hand changes. There will be controversy. Issues often raised in connection with the advocacy and adoption of prevention measures include: the appropriate role of government in fostering personal behavior change; the philosophy and psychology of throwing responsibility for serious health problems back to the victim; the role of business and industrial processes in health and disease; the preferential treatment of certain categories of people for insurance purposes; the role of government in regulating health protection measures.

Despite such questions, the objectives presented in *Promoting Health/Preventing Disease* represent an important component of a focused National prevention strategy. Substantial gains to the health of Americans can be attained if we have the will to apply what we know. From the Federal perspective, work is already under way to apply the capabilities of Federally sponsored programs to the agenda set forth. If similar efforts are undertaken at the State and local levels to design measures for implementing locally-based objectives, progress can be greatly facilitated. To draw upon the last line of *Healthy People,* "If the commitment is made at every level, we ought to attain the goals established in this report, and Americans who might otherwise have suffered disease and disability will instead be healthy people."

HIGH BLOOD PRESSURE CONTROL

1. Nature and Extent of the Problem

High blood pressure is perhaps the most potent of the risk factors for coronary heart disease and stroke—and contributes as well to diseases of the kidney and eyes. Because it is asymptomatic, a large number of people are unaware of their condition. High blood pressure is, however, only one of several risk factors for heart disease and stroke. Other prominent factors for heart disease include cigarette smoking, elevated blood cholesterol levels, diabetes and obesity. It is essential to recognize the multiple nature of these risks and their proved or suspected interaction. Correspondingly, both health professionals and the public need to know more about approaches for dealing comprehensively with these multiple risk factors and how to act on the basis of this knowledge. Control of high blood pressure requires patients to adhere to regimens over their lifetime. These may include various combinations of pharmaceutical interventions and changes in diet, exercise and stress management practices. (See Smoking and Health, Nutrition, Physical Fitness and Exercise, and Control of Stress and Violent Behavior.)

a. Health implications

- Heart disease, the leading cause of death in the U.S. population, was responsible for over 700,000 deaths in 1977; stroke led to 183,000 deaths in that year. Survivors are often severely handicapped.
- About 60 million people have elevated blood pressures (above 140/90) and are at increased risk for death and illness.
- Of these, about 35 million people (15 percent of the U.S. population) have high blood pressure at, or above 160/95, which is the World Health Organization definite determination of hypertension. These people face excess risk of death or illness from heart attack, heart failure, stroke, and kidney failure, and are the primary targets for control efforts.
- Much of this excess risk is attributable to mild high blood pressure (90 to 104 mm Hg diastolic blood pressure without complications). Based on 1979 research results, intervention seems warranted in a large proportion of this population.
- Other important risk groups are: persons with diastolic blood pressure over 104 (for whom drugs have been proven beneficial); populations having a high prevalence (e.g., blacks and elderly); persons with limited access to, or use of, medical care such as young men and the poor.
- Among special issues are the growing proportion of elderly in the population, their high prevalence of high blood pressure, uncertainty about the benefit of treating isolated systolic blood pressure and the sometimes unpredictable side effects of drugs used to control high blood pressure in older people.
- Children present an opportunity, since precursors of high blood pressure may be identified in them, but also present a dilemma as the benefit of early intervention in this population is not known and a firm consensus on defining high blood pressure in youngsters has not yet been reached. Changes in habitual diet may prove useful in prevention.

b. Status and trends

- Although blood pressure can be controlled, the specific cause of 90 to 95 percent of high blood pressure is not known. Thus, while short-term emphasis must be placed on control, increased understanding of the causes of hypertension must be pursued to enable prevention of high blood pressure in the long run.
- High salt intake is associated with high blood pressure in susceptible people; reduced salt intake is one measure for reducing high blood pressure.
- Many successful approaches to detection and control (e.g., use of allied health personnel, worksite care, patient tracking systems) are not yet widely adopted or integrated into mainstream care.
- Although prevalence data indicate a problem of great magnitude, incidence data for high blood pressure and its complications do not exist to aid improved planning of intervention strategies for both primary and secondary prevention.
- Men are only half as likely as women to have their high blood pressure controlled.
- Rural (non-SMSA) areas and urban inner city areas have made less progress in high blood pressure control in recent years than have metropolitan areas.
- Many health professionals are inattentive to regimen adherence issues and lack skills to deal with adherence.
- School health education rarely addresses risk

factor control and lifestyle impact on health in a satisfactory way.

- The proportion of the population with high blood pressure who are aware of their condition and are successfully controlling it appears to have doubled in the last 5 years, while the proportion of this population who are unaware of their condition has sharply decreased. However, the proportion who are aware of their condition, but whose high blood pressure remains untreated or uncontrolled, appears to have stayed constant.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - — continuing current efforts to heighten professional and public awareness of possibilities for blood pressure control, with messages targeted to groups at special risk, such as black males, the elderly and users of oral contraceptives;
  - — informing the public that daily intake of over 5 grams of total salt (2 grams sodium) is not essential for good health and may contribute to the development of high blood pressure in some people;
  - — developing and distributing palatable recipes for low sodium diets;
  - — raising public awareness that overweight predisposes to high blood pressure and weight control often assists blood pressure control; avoidance of juvenile obesity is especially important;
  - — encouraging increased physical activity and understanding that maintaining an appropriate balance between the energy individuals expend in their daily physical activity and the amount of energy they consume through the food they eat determines their success in controlling weight;
  - — increasing public awareness of the fact that stress reduction and exercise may be useful adjuncts for some persons to provide a healthy lifestyle and lessen the risk of hypertension;
  - — increasing public awareness of multiple risk factors and the interaction of risk factors;
  - — alerting physicians on value of monitoring the children of hypertensives with attention to weight control and low salt intake;
  - — increasing professional school training in behavioral/motivation skills;
  - — involving specialists in behavioral medicine in teaching programs and assisting in patient adherence to regimens;
  - — encouraging introduction/inclusion of health-related content into the curricula of public/private institutions which train food preparation/processing personnel;
  - — more active nutrition education in school health and lunch programs for school children and for the elderly;
  - — influencing industry to take active steps to promote high blood pressure control/prevention among its employees and throughout the Nation by changes in both products (primarily reduced sodium content of processed foods) and marketing approaches;
  - — increasing awareness by employers and the public of the potential for insurance premium cost savings associated with blood pressure control, not smoking and weight control among individual and group policy purchasers.
- Service measures include:
  - — providing blood pressure checks routinely at contact with health providers (e.g., physicians, dentists, nurse practitioners) and through programs staffed by suitably trained non-professionals (e.g., firemen);
  - — providing high blood pressure detection and treatment services at the worksite with a systematic program for follow-up;
  - — giving health providers instruction in techniques to improve patient adherence to blood pressure control regimens.
- Technologic measures include:
  - — increasing use of systems/policy analysis methods in program planning at all levels;
  - — reducing fat content (caloric density) and sodium content of snack and highly processed foods;
  - — developing practical means to supply low sodium content water to populations living in "hard" water areas.
- Legislative and regulatory measures include:
  - — promoting consumer choice through labeling of foods for sodium and caloric content;
  - — seeking uniform National guidelines and Federal agency (National Institutes of Health, Department of Agriculture, and Food and Drug Administration) policies for nutrition (e.g., sodium consumption, total dietary fat content);
  - — modifying State practice acts to provide for expanded roles of allied health professionals in the management/control of high blood pressure.
- Economic measures include:
  - — providing free or low cost access to blood pressure checks during intervals between physician examinations;
  - — reducing economic barriers (e.g., reimbursement, training costs) to use of allied health personnel;
  - — providing industry with tax incentives to en-

courage development of lower calorie, fat, sodium-containing foodstuffs;
- reducing economic barriers to control through reimbursement for antihypertension prescription drugs.

b. Relative strength of the measures

- Education and information measures:
  - established impact; low technology implementation possible; wide acceptance of this approach now exists, excellent cost/effective potential.
- Service measures:
  - effective with potential for significant impact.
- Technologic measures:
  - use of systems analysis approach to planning to facilitate more comprehensive/objective problem analysis resulting in more effective plans;
  - food content changes to allow greater consumer choice; may influence a major source of caloric self-abuse, and could be especially relevant to school children among whom adverse eating patterns have lasting effects.
- Legislative and regulatory measures:
  - not well evaluated as a behavioral tool, slow to achieve results.
- Economic measures:
  - difficult to achieve but usually effective when accomplished.

3. Specific Objectives for 1990 or Earlier

- Improved health status

a. By 1990, at least 60 percent of the estimated population having definite high blood pressure (160/95) should have attained successful long term blood pressure control, i.e., a blood pressure at or below 140/90 for two or more years. (High blood pressure control rates vary among communities and States, with the range generally being from 25 to 60 percent based on current data.)

- Reduced risk factors

*b. By 1990, the average daily sodium ingestion (as measured by excretion) for adults should be reduced at least to the 3 to 6 gram range. (In 1979, estimates ranged between averages of 4 to 10 grams sodium. One gram salt provides approximately .4 grams sodium.)

*c. By 1990, the prevalence of significant overweight (120 percent of "desired" weight) among the U.S. adult population should be decreased to 10 percent of men and 17 percent of women, without nutritional impairment. (In 1971–74, 14 percent of adult men and 24 percent of women were more than 120 percent of "desired" weight.)

***NOTE:** Same objectives as for Nutrition.

- Increased public/professional awareness

d. By 1990, at least 50 percent of adults should be able to state the principal risk factors for coronary heart disease and stroke, i.e., high blood pressure, cigarette smoking, elevated blood cholesterol levels, diabetes. (Baseline data unavailable.)

e. By 1990, at least 90 percent of adults should be able to state whether their current blood pressure is normal (below 140/90) or elevated, based on a reading taken at the most recent visit to a medical or dental professional or other trained reader. (In 1971–74, 55 percent of people with high blood pressure greater than 160/95 were not aware of their condition.)

- Improved services/protection

f. By 1990, no geopolitical area of the United States should be without an effective public program to identify persons with high blood pressure and to follow up on their treatment. (Baseline data unavailable.)

g. By 1985, at least 50 percent of processed food sold in grocery stores should be labeled to inform the consumer of sodium and caloric content, employing understandable, standardized, quantitative terms. (In 1979, labeling for sodium was rare; the extent of calorie labeling was about 50 percent in the market place.)

— See Nutrition.

- Improved surveillance/evaluation systems

h. By 1985, a system should be developed to determine the incidence of high blood pressure, coronary heart disease, congestive heart failure and hemorrhagic and occlusive strokes. After demonstrated feasibility, by 1990 ongoing sets of these data should be developed.

i. By 1985, a methodology should be developed to assess categories of high blood pressure control, and a National baseline study of this status should be completed. Five categories are suggested: (1) Unaware; (2) Aware, not under care; (3) Aware, under care, not controlled; (4) Aware, under care, controlled; and (5) Aware, monitored without therapy.

4. Principal Assumptions

- The etiology of high blood pressure is multifactorial and no research breakthrough will eliminate it as a public health problem in the next decade.
- The basic components of successful control programs will continue to be detection, evaluation, treatment and/or changes in lifestyle, and follow-up.
- While there are still some uncertainties about the quantitative relationship between sodium ingestion and high blood pressure, it is important to begin moving in the direction suggested by the data.
- While there is not yet a true consensus as to what constitutes dangerous levels of overweight for the population as a whole, the stated targets provide the pattern for a productive trend.

- Governmental efforts to control high blood pressure will be continued and expanded.
- Voluntary and private sector efforts to control high blood pressure will be continued and expanded.
- Health Systems Agencies will give high priority to high blood pressure detection, treatment and control.
- Implementation of the smoking, nutrition, and physical activity recommendations (see appropriate sections) will impact favorably on the prevention and control of high blood pressure.

5. Data Sources

a. To National level only

- Health and Nutrition Examination Survey (HANES). Prevalence of hypertension by demographic characteristics; blood pressure distributions; some data on awareness and control status. DHHS-National Center for Health Statistics (NCHS). NCHS *Vital and Health Statistics,* Series 11, selected reports, especially No. 203, and *Advance Data from Vital and Health Statistics,* selected reports. Periodic National surveys, obtaining data from physical examinations, clinical and laboratory tests and related measurement procedures on National probability sample of the U.S. civilian noninstitutionalized population. Data on adults currently available from the 1960–1962 Health Examination Survey and the 1971–1974 HANES. 1971–1975 data are expected during 1980. 1976–1980 data not yet available.
- Health Interview Survey (HIS). Interview reported data on prevalence of hypertension by demographic characteristics, disability days associated with high blood pressure therapy and regimen adherence, and other related topics. DHHS-NCHS, NCHS *Vital and Health Statistics,* Series 10, selected reports, especially No. 121, and *Advance Data from Vital and Health Statistics.* Continuing household interview health survey; National probability samples of the U.S. civilian noninstitutionalized population. Special survey on hypertension conducted in 1974. Data on hypertension available from the 1972 and 1978 HIS will be published in the 1979 and 1980 survey reports.
- National Ambulatory Medical Care Survey (NAMCS). Patient visits to office-based private practice physicians in the U.S. by patient and physician characteristics, diagnosis (including high blood pressure and its sequelae), patient's reason for the visit and services provided. DHHS-NCHS. NCHS *Vital and Health Statistics,* Series 13, selected reports and *Advance Data from Vital and Health Statistics.* Continuing survey, since 1973; National probability sample of office-based physicians.
- Hospital Discharge Survey (HDS). Patient stays in short-term hospitals, by patient characteristics, diagnosis (including high blood pressure and its sequelae), survey and other procedures. DHHS-NCHS. NCHS *Vital and Health Statistics,* Series 13, selected reports. Continuing survey, since 1965; data from discharge records of samples of patients in a National probability sample of general and special short stay hospitals.
- National Disease and Therapeutic Index (NDTI). Patient visits to office-based private practice physicians in the United States by patient and physician characteristics, type of visit, diagnosis (including high blood pressure and its sequelae), whether blood pressure was measured and actual measurement and prescribing behavior of the physician. IMS America, Ltd., Ambler, Pennsylvania. Regular reports from IMS, plus specially requested computer tabulations. Continuing survey from a representative sample panel of physicians in private practice. Blood pressure measurements available only since 1976.
- National Prescription Audit (NPA). Drug sales (including hypertensive drugs), source of prescription, payment status and prescriber type. IMS America, Ltd., Ambler, Pennsylvania. IMS reports. Continuing audit of pharmacies on IMS panel.
- Physician response to high blood pressure diagnosis. Physicians' knowledge, attitudes and behavior toward high blood pressure; perceived importance of high blood pressure diagnosis and treatment practices. Surveys conducted for DHHS-Food and Drug Administration (FDA) and the National High Blood Pressure Education Program (NHBPEP), National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health. DHHS Publication No. (NIH) 79–1056, *Diagnosis and Management of Hypertension: A Nationwide Survey of Physicians' Knowledge, Attitudes and Reported Behavior.* National survey 1977; follow-up surveys anticipated.
- The public's view of high blood pressure. Public knowledge, attitudes and reported behavior towards high blood pressure. Surveys conducted for NHBPEP-NHLBI, National Institutes of Health. DHHS Publication No. (NIH) 77–356 (1973 survey), *The Public and High Blood Pressure: A Survey.* 1979 survey to be published. Periodic surveys; National probability sample of the U.S. adult population.
- Hypertension Detection and Follow Up Program. State of knowledge among persons of high risk of coronary and vascular diseases. DHHS-NHLBI. NHLBI (NIH) *Hypertension Task Force Reports,* Nos. 8 and 9. One time survey.

b. To State and/or local level

- National Vital Registration System
  — Mortality. Deaths by cause, including hyper-

tension and hypertension-related sequelae, by age, sex and race. DHHS-NCHS. NCHS *Vital Statistics of the United States,* Vol. II, and NCHS *Monthly Vital Statistics Reports.* Continuing reporting from States; National full count. (Many States issue earlier reports.)

- Hospitalized illness discharge abstract systems
  - — Professional Activities Study (PAS). Patients in short stay hospitals; patient characteristics, diagnoses of hypertension and hypertension-related sequelae, procedures performed, length of stays. Commission on Professional and Hospital Activities, Ann Arbor, Michigan. Annual reports and tapes. Continuous reporting from 1900 CPHA member hospitals. Not a probability sample; extent of hospital participation varies by State.
  - — Medicare hospital patient reporting system (MEDPAR). Characteristics of Medicare patients, diagnosis, procedures by hospitals, HSA areas. DHHS-Health Care Financing Administration, Office of Research, Demonstration and Statistics (ORDS). Periodic reports 1975, 1976, 1977. Continuing reporting from hospital claim data, 20 percent sample.
  - — Other hospital discharge systems as locally available.
- Selected health data. DHHS-NCHS. NCHS *Statistical Notes for Health Planners.* Compilation and analysis of data to State level.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and county level from various sources. DHHS-Health Resources Administration, *Area Resource File: A Manpower Planning and Research Tool,* DHHS–HRA–80–4, Oct 79. One time compilation.

FAMILY PLANNING

1. Nature and Extent of the Problem

Family planning is based on the voluntary decisions and actions of individuals. Its purpose is to enable individuals to make their own decisions regarding reproduction and to implement their decisions. Family planning includes measures both to prevent unintended fertility and to overcome unintended infertility.

a. Health implications

- Family planning is a preventive health measure which supports:
  - — maternal and infant health;
  - — the emotional and social health of individuals and the family.
- Pregnancies among teenagers, among women who are unmarried, among women over the age of 34 and among high parity women are all associated with higher than average rates of maternal and/or infant morbidity and mortality. They are also more likely than other pregnancies to be unintended and unwanted.
- Compared to pregnancies carried by women in the most favorable childbearing years, teenage pregnancies are associated with markedly increased risks of maternal morbidity and mortality and of premature and other low birth weight infants who have reduced chances of surviving infancy and high rates of serious neurological impairment.
- Adolescent motherhood is associated with greater risk of lowered educational and occupational attainment, reduced income and increased likelihood of welfare dependency.
- Unwanted pregnancies impose psychological and social costs that often continue throughout the lifetimes of the mother and the child.

b. Status and trends

- In 1978, about 545,000 babies were born to unmarried American women, almost half of whom were teenagers.
- Although fertility rates for teenagers are declining in the United States, the rates continue to exceed those in more than a dozen developed countries. Both the birth rate and the number of births for unmarried women are increasing; unmarried mothers are more likely to have begun prenatal care late in pregnancy and to have made fewer prenatal visits than married mothers; infants born to single mothers are more likely to have a low birth weight.
- Ten percent of babies born to married American women between 1973–1976 resulted from conceptions the mothers wished had never happened. An additional 25 percent resulted from pregnancies which the mothers wanted to have some time in the future but which occurred too early in their lives.
- Certain subgroups of our population have disproportionately high risks of unintended pregnancy and childbearing. Examples include:
  - — unplanned births are almost twice as frequent in poor as compared to nonpoor families (52 percent of births that occurred during the previous five years were unplanned as reported in 1976 by women with family incomes below the poverty level, compared to 29.2 percent for women with family incomes of 150 percent of poverty level or higher);
  - — reports of black women in a 1973 survey that one of every four of their births had been unintended, versus reports by white women that only one of every 10 of their births had been unintended;
  - — high rates of unintended pregnancy among teenagers, women with language barriers and/or illegal immigration status, women living in rural areas on on Indian reservations and members of some religious groups.
- More than a million American women have pregnancies terminated by abortion every year. The teenage population accounts for aproximately one-third of these abortions.
- The risk of death associated with temporary methods of contraceptions, sterilization and legal abortion is less than the risk of death from childbearing, although the absolute numbers of deaths are about equal.
- Many deaths associated with methods of contraception are preventable, including those associated with:
  - — smoking by women who use oral contraceptives;
  - — oral contraceptives with unnecessarily high estrogen content;
  - — legal abortions performed after the first trimester of pregnancy;

  - illegal abortion.
- The psychological and biologic bases and underlying causes of a large proportion of infertility cases are not understood and/or are not remediable by medical treatment. Those treatments which are available technically are costly and are largely inaccessible to the poor.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - providing content on human sexuality, reproduction, family planning and parenting in the curricula of schools which train personnel for delivery of human services (i.e., professional schools for social workers, clergy, nurses, nurse practitioners, teachers, counselors, pharmacists and physicians);
  - providing content on human sexuality, reproduction and contraception within continuing education programs for graduate level professionals involved in human services;
  - incorporating into elementary and high school educational programs a family life curriculum which includes human sexuality, reproduction, contraception and parenting as well as approaches to decision-making and values clarification—offering parents opportunities to participate in parallel programs;
  - using a variety of approaches to inform teenagers about prescription and nonprescription contraceptives, including how they work, their relative effectiveness, how to use them effectively, their availability and cost;
  - educating parents to provide effective and accurate sex education to their children;
  - encouraging and assisting the public media to educate the public, especially parents and young people, about the realities and possible problems of unwanted pregnancies, and to present appropriate role models for teenagers;
  - using the public media as appropriate for advertisements explaining the use, cost and benefits of certain over-the-counter contraceptives;
  - upgrading the knowledge of family planning clinicians regarding the relative risks and effectiveness of all family planning methods and of lifestyle characteristics which may place certain individuals at increased risk of complications associated with one or more specific methods, such as smoking by users of oral contraception;
  - upgrading the counseling skills of individuals who work in health care settings which serve adolescents—taking care to avoid coercive implications;
  - improving knowledge within the general public (both males and females) of the relative safety and effectiveness of available family planning methods;
  - preparing and expecting family planning counselors and clinicians to include concern for protection of future fertility and prevention of sexually transmitted diseases when they counsel family planning clients regarding selection of a family planning method;
  - improving knowledge and skills of family planning educators, counselors and clinicians regarding "natural" family planning methods which require periodic abstinence;
  - increasing awareness of family planning problems among health care planners;
  - informing HSAs how to interpret local data relevant to family planning.
- Service measures include:
  - making all forms of contraception accessible and acceptable to people who find the currently available services either inaccessible or unacceptable;
  - encouraging wider and more varied distribution of effective nonprescription contraceptives (in medical and other settings);
  - providing opportunities for teenage boys and girls to attend family planning educational and counseling sessions in environments not identified specifically for family planning and in which they do not feel pressure to make a decision regarding use of contraception;
  - providing family planning education, counseling and services to sexually active males as well as females;
  - reducing the waiting time required for the social, educational and medical assessment of clients in family planning clinics;
  - ensuring that family planning is part of routine perinatal service (if a woman is breastfeeding, preference should be given to contraceptive methods which do not interfere with normal lactation).
- Technologic measures include:
  - development of more reliable, acceptable contraceptive methods for men and women.

b. Relative strength of the measures

- By 1976, 68 percent of married U.S. couples were using contraception:
  - almost 80 percent of married users were employing methods which are at least 95 percent effective in preventing conception (male or female surgical sterilization, oral contraception or an intrauterine device);
  - most of the 32 percent non-users were try-

ing to conceive, were pregnant, post partum, subfecund or sterile because of surgery performed for a non-contraceptive reason;
  - fewer than 8 percent of married couples were not using contraception for some other reason, including lack of access to services.
- Some forms of infertility are related to sexually transmitted diseases and to other known causes. However, in a high proportion of cases, basic knowledge for prevention and treatment is not yet available.

3. Specific Objectives for 1990 or Earlier

- Improved health status
  - Avoiding the personal or social burdens of unintended pregnancy (or infertility) is an important health status objective, though not easily quantifiable. However, family planning is a key component of efforts to reduce infant and maternal mortality.
  - See Pregnancy and Infant Health.
- Reduced risk factors*

a. By 1990, there should be virtually no unintended births to girls 14 years old or younger. Fulfilling this objective would probably reduce births in this age group to near zero. (In 1978, there were less than 10,800 births in this age group.)

b. By 1990, the fertility rate for 15-year-old girls should be reduced to 10 per 1,000. (In 1978, there were 14.2 births per 1,000 for this age group.)

c. By 1990, the fertility rate for 16-year-old girls should be reduced to 25 per 1,000. (In 1978, there were 31.8 births per 1,000 for this age group.)

d. By 1990, the fertility rate for 17-year-old girls should be reduced to 45 per 1,000. (In 1978, there were 52.1 births per 1,000 for this age group.)

e. By 1990, reductions in unintended births among single American women (15 to 44 years of age) should reduce the fertility rate in this group to 18 per 1,000. (In 1978, there were 26.2 births per 1,000 unmarried women 15 to 44 years of age.)

f. By 1990, the proportion of abortions performed in the second trimester of pregnancy should be reduced to 6 percent (in 1976, about 11 percent of abortions were performed in the second trimester), thereby reducing the death-to-case rate for legal abortions in the United States to 0.5 per 100,000. (In 1977, it was 1.4 per 100,000.)

g. By 1990, the availability of family planning information and methods (education, counseling and medical services) to all women and men should have sufficiently increased to reduce by 50 percent the disparity between Americans of different economic levels in their ability to avoid unplanned births. (In 1976, 52 percent of births that occurred during the previous five years reported by evermarried women with family incomes below the poverty level were unplanned, compared to 29.2 percent for women with family incomes of 150 percent of poverty level or higher.)

***NOTE:** Objectives a. to e. specify reductions in the fertility rate to reduce unintended births for specific age and marital status groups of women. Some births to women in these groups are planned. However, unintended births account for a very large proportion of births to women in these groups. Thus, reductions in unintended births would allow the target objectives to be met without affecting the numbers of planned births.

- Increased public/professional awareness

h. By 1990, at least 75 percent of men and women over the age of 14 should be able to describe accurately the various contraceptive methods, including the relative safety and effectiveness of one method versus the others. (Baseline data unavailable.)

- Improved services/protection

i. By 1985, sales of oral contraceptives containing more than 50 micrograms of estrogen should have been reduced to 15 percent of total sales. (In 1978, about 27.1 percent of preparations sold were at this level.)

j. By 1985, 100 percent of Federally funded family planning programs should have an established routine for providing an initial infertility assessment, either directly or through referral. (Baseline data unavailable.)

4. Principal Assumptions

- There will continue to be no policy on population growth in the United States. Therefore, the goals and objectives of family planning are predicated solely on individual choice, social responsibility and concern for health.
- Stable families promote the physical, emotional and social health of the family members, community and society. The ability of couples to plan the number and timing of the births of their children supports the stability of families.
- Religious convictions will be respected in the development of fertility control policies and programs.
- Federal support of family planning services will increase as evidence grows on the ability of family planning dollars to effect savings in dollars expended to address problems in other publicly-financed health, social and welfare programs.
- The mechanisms for funding clinical family planning services will remain the same.
- Legal, socioeconomic and institutional barriers to contraception will be removed.
- Federal support of population and family planning research will continue.
- Although the overall U.S. abortion rate may decline

somewhat by 1990, the incidence of abortion among certain high risk groups will not decrease significantly.

- There will be no major breakthroughs in contraceptive technology available to the public during the 1980s.
- Education can result in behavioral change.
- Few adolescents younger than age 18 are adequately prepared for the responsibilities of parenthood.
- The current trend of an increasing proportion of adolescents who are sexually active will continue. However, many teenagers are not ready for sexual relationships which include intercourse, and the majority of adolescents under 18 will continue to defer sexual activity.
- In the 1980s, industry will not invest heavily in research and development of new contraceptive methods.

5. Data Sources

a. To National level only

- National Survey of Family Growth (NSFG). Proportion of women sexually active by age, race and marital status, and a wide range of socioeconomic characteristics; fertility experience (pregnancy histories) of the sexually active poulation, including sterility and subfecundity; planning status of each pregnancy according to whether contraception had been used and whether the birth had been wanted, mistimed (wanted but as a later date), or unwanted at the time of conception; pregnancy outcome and survival of the newborn; family planning services received; sources of contraceptive supplies, including over-the-counter methods; contraceptive methods being used, use-effectiveness of methods; switching of methods and reasons for switching, side effects of contraception. DHHS–NCHS. NCHS *Vital and Health Statistics*, Series 23, selected reports. Interview survey of 10,000 women in National probability sample representing American women 15–44 years of age. Surveys in 1973 and 1976 limited to women who were or had been married, or single with offspring in the household. In later surveys, all women 15–44 years of age will be represented.
- The National Prescription Audit (NPA). Distribution of contraceptive prescriptions written by physicians, by hormonal potency. IMS America Ltd., Ambler, Pennsylvania. Selected reports. Continuing survey; pharmacies on MS panel.
- National Reporting System for Family Planning Services (NRSFPS). Visits to family planning clinics. DHHS–NCHS. Annual reports. Continuous sample survey since June 1977; continuous full count reporting from 1972 to June 1977.

b. To State and/or local level

- Abortion Surveillance. Number and characteristics of women who have legally induced abortions in the United States, abortion related morbidity and mortality. DHHS–Center for Disease Control (CDC). Annual reports since 1972. Continuous reporting of abortions from central health agencies in 40 States and from hospitals and/or other facilities in the remaining jurisdictions. Abortion related deaths reported from the vital statistics section of State health departments, abortion related morbidity reported from the Joint Program for the Study of Abortion.
- National Vital Registration System
  - — Natality. Births and birth rates by place of occurrence and by the mother's place of residence, age, race and parity. DHHS–NCHS. NCHS *Vital and Health Statistics*, Series 21, selected reports, and *Monthly Vital Statistics* Report. Continuous reporting by States; full count of birth certificates 38 States; 50 percent sample remaining States. State health agencies, derived from certificates of live births to U.S. residents. Birth rates calculated on the basis of the number of women 14–49 years of age residing in the respective areas, enumerated in census years, and estimated for intercensus years.

PREGNANCY AND INFANT HEALTH

1. Nature and Extent of the Problem

Assuring all infants a healthy start in life and enhancing the health of their mothers are among the highest priorities in preventing disease and promoting health. The principal threats to infant health are problems associated with low birth weight and birth defects which can lead to lifelong handicapping conditions. Of particular concern are the disparities in the health of mothers and infants that exist between different population groups in this country. These differences are associated with a variety of factors, including those related to the health of the mother before and during pregnancy as well as parental socioeconomic status and lifestyle characteristics. Although the precise relationship between specific health services and the health status of pregnant women and their infants is not certain, the provision of high quality prenatal, obstetrical, and neonatal care, and preventive services during the first year of life, can reduce a newborn's risk of illness and death. Of particular concern are adolescents, whose infants experience a high degree of low birth weight and whose health problems should be addressed in a broad context taking into consideration social and psychological implications.

a. Health implications

- Maternal and infant mortality and morbidity records show striking demographic variations:
  - — an overall rate of maternal mortality of 9.6 per 100,000 live births in 1978, but with a rate for blacks almost four times that for whites;
  - — an infant mortality rate of 13.8 per 1,000 live births in 1978, but with the infant mortality rate for black babies 92 percent higher than for whites;
  - — infant mortality rates for individual States ranged from 10.4 to 18.7 in 1978;
  - — infant mortality rates in 1977 for 26 major cities (with populations greater than 500,000) ranged from 10.0 to 27.4; 22 of the 26 major cities had higher rates than the National average of 14.1 in 1977.
- The greatest single problem associated with infant mortality is low birth weight; nearly two-thirds of the infants who die are low birth weight.
- Maternal factors associated with a high risk of low birth weight babies are: age (17 and under, and 35 and over), minority status, high parity, previous unfavorable pregnancy outcome, low education level, low socioeconomic status, inter-pregnancy interval less than 6 months, inadequate weight gain during pregnancy, poor nutrition, smoking, misuse of alcohol and drugs and lack of prenatal care.
- High quality early and continuous prenatal, birth and postnatal care can decrease a newborn's risk of death or handicap from pregnancy complications, low birth weight, maternal infection from sexually transmitted disease and developmental problems, both physical and psychological.
- After the neonatal period the causes of infant mortality and morbidity, many of which may be preventable, are: disorders related to a high risk birth, infectious diseases, congenital anomalies, accidents, lack of health care and abuse.

b. Status and trends

- Although the overall rate has been gradually improving since 1965, an excessive number of infants born in the United States are of less than optimal birth weight for survival and good health. This includes:
  - — approximately 7 percent of all babies are of low birth weight, that is, 2,500 grams or less; the rate is almost twice as high for blacks; other industrialized nations experienced substantially lower rates during the period 1970-1976; for example in Japan 5.3 percent of births were low birth weight and in Sweden 4.1;
  - — approximately another 17 percent of all newborns in the United States in 1978 had birth weights falling between 2,501 and 3,000 grams.
- Many children in the United States are born to women who have an increased risk of having a low birth weight infant or other health problems, particularly:
  - — the 25 percent of women giving birth in 1978 who made no prenatal visit during the first trimester and the 5 percent who had no prenatal care during either of the first two trimesters;

- the pregnant teenagers (at higher risk for low birth weight babies) who accounted for 17 percent of the infants born in 1978;
- the two-thirds of pregnant teenagers in 1976 whose pregnancies were not intended when they occurred;
- the births to single women (26.2 births per 1,000 single women in 1978) for whom the data indicate special risk of poor health outcomes for mother and infant.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - developing, implementing and evaluating the quality and quantity of health education curricula in schools and communities, with emphasis on lifestyle risk factors (poor nutrition and use of alcohol, cigarettes and drugs), as well as family life and parenting;
  - developing, implementing and evaluating preventive educational strategies and materials for use in private and public prenatal care;
  - increasing the use of mass media to encourage more healthful lifestyles; developing television and radio programs that support healthful lifestyles;
  - making prospective parents at high risk of impaired fetuses aware of genetic diagnosis and counseling services so that those affected can make informed decisions consistent with their personal ethical and religious values;
  - promoting, educating and supporting breastfeeding where possible.
- Service measures include:
  - family planning services which optimize the timing of pregnancies;
  - prenatal care which routinely includes education on avoidable risks to maternal and fetal health during pregnancy;
  - assuring that all populations are served by organized medical care systems that include providers (physicians, nurse practitioners, nurse midwives, nutritionists and others) who are trained to deliver prenatal, postnatal and infant care on site (requires personnel strategies and economic and professional incentives);
  - developing local, easily accessible prenatal services for all, including access to amniocentesis for high risk pregnant women;
  - regionalizing prenatal and perinatal services so that all women and newborns receive diagnostic and therapeutic care appropriate to their assessed needs;
  - assuring adequate linkages, including transportation, to regional centers for high risk expectant mothers and newborns;
  - outreach perinatal and infant care services for currently underserved populations, such as teenage expectant mothers;
  - evaluating the quality of perinatal and infant care being received and relating program activities to pregnancy and infant health outcomes;
  - identifying and tracking infants and families with medical, congenital, psychological, social, and/or environmental problems;
  - reducing the number of low birth weight infants by reducing teenage and other high risk pregnancies, reducing damaging effects from alcohol, cigarettes and other toxic substances, improving nutrition, and assuring participation in comprehensive preconceptional, inter-conceptional and early and continuing prenatal care;
  - eliminating unnecessary radiation exposure to pregnant women and babies;
  - assuring that all programs of primary care support and contribute to the fulfillment of objectives related to maternal and infant health;
  - encouraging parent support groups, hotlines, and counseling for parents of high risk infants and supports for lowering stress levels in troubled parents who may have potential for child abuse.
  - See Family Planning, Immunization, and Sexually Transmitted Diseases.
- Legislative and regulatory measures include:
  - requiring that all Federally funded programs for delivering perinatal care assure adequate health and prenatal education, screening for pregnancy risks and patient plans for care during labor and delivery appropriate to discovered risks, and for infant follow-up and care through the first year of life;
  - requiring fiscal and pregnancy outcome accountability in publicly funded prenatal and perinatal programs;
  - reducing exposures to toxic agents that may contribute to physical handicaps or cognitive impairment of babies.
- Economic measures include:
  - reviewing all programs that finance or provide health services for mothers and children in order to:
    - assure inclusion of health promotion and preventive services;
    - optimize their effect by reducing overlaps, pockets of neglect and contradictory objectives;
  - adequate public financing for outreach, early and continuous prenatal care, deliveries, support services, intensive care when needed and continuing care of infants;

— consideration of direct Federal financing tied to uniform standards of performance where public health departments show potential for expanding maternal and child health services to populations in need.

b. Relative strength of the measures

- The relative effectiveness of various interventions to improve pregnancy outcome and infant health is not without controversy. The records of many demonstration projects, both domestic and foreign, amply confirm that dramatic improvements can be made in the indicators of maternal and infant health. For example, the infant mortality rate for American Indians was reduced by 74 percent between 1955-1977 and maternal mortality decreased from 2.2 times the total U.S. rate in 1958, to below the total U.S. rate by 1975-76. Unfortunately, studies have not generally been designed to yield firmly defensible data on the relative contribution of programs. However, the evidence indicates that emphasis be placed on family planing which optimizes the timing of pregnancies, early identification of pregnancy and routine involvement of all pregnant women in prenatal care. Therefore, the following priorities are strongly suggested:

— systems of care that reach everyone with basic services, emphasizing advantageous personal health behavior and including outreach, education, and easy access to community-based services without social, economic, ethnic or time or distance barriers;

— measures which prevent unwanted pregnancies and which optimize the most favorable maternal age for childbearing, including sex education, contraception, easy access to pregnancy testing, genetic counseling, prenatal diagnosis and associated counseling;

— early and continuing prenatal care, particularly for those at greatest risk—poor, poorly educated women, those near the beginning or the end of their reproductive age, those with previous pregnancy loss and those with recent pregnancy;

— nutrition education and food supplementation as needed, as well as parent education on importance of good infant nutrition, preventive measures essential to avoid childhood disease and accidents and parenting conducive to sound emotional development;

— cessation of smoking during pregnancy (which may contribute much more to the improvement of birth weight and to favorable pregnancy outcome than is now fully documented);

— regionalized programs of care with referral system which assure access to levels of care appropriate to special risks.

3. Specific Objectives for 1990

- Improved health status

a. By 1990, the National infant mortality rate (deaths for all babies up to one year of age) should be reduced to no more than 9 deaths per 1,000 live births. (In 1978, the infant mortality rate was 13.8 per 1,000 live births.)

b. By 1990, no county and no racial or ethnic group of the population (e.g., black, Hispanic, Indian) should have an infant mortality rate in excess of 12 deaths per 1,000 live births. (In 1978, the infant mortality rate for whites was 12.0 per 1,000 live births; for blacks 23.1 per 1,000 live births; for American Indians 13.7 per 1,000 live births; rate for Hispanics is not yet available separately.)

c. By 1990, the neonatal death rate (deaths for all infants up to 28 days old) should be reduced to no more than 6.5 deaths per 1,000 live births. (In 1978, the neonatal death rate was 9.5 per 1,000 live births.)

d. By 1990, the perinatal death rate should be reduced to no more than 5.5 per 1,000.* (In 1977, the perinatal death rate was 15.4 per 1,000.)

***NOTE:** The perinatal death rate is total deaths (late fetal deaths over 28 weeks gestation plus infant deaths up to 7 days old) expressed as a rate per 1,000 live births and late fetal deaths.

e. By 1990, the maternal mortality rate should not exceed 5 per 100,000 live births for any county or for any ethnic group (e.g., black, Hispanic, American Indian). In 1978, the overall rate was 9.6—the rate for blacks was 25.0, the rate for whites was 6.4, the rate for American Indians was 12.1; the rate for Hispanics is not yet available separately.)

f. By 1990, the incidence of neural tube defects should be reduced to 1.0 per 1,000 live births. (In 1979, the rate was 1.7 per 1,000.)

g. By 1990, Rhesus hemolytic disease of the newborn should be reduced to below a rate of 1.3 per 1,000 live births. (In 1977, the rate was 1.8 per 1,000.)

*h. By 1990, the incidence of infants born with Fetal Alcohol Syndrome should be reduced by 25 percent. (In 1977, the rate was 1 per 2,000 births or aproximately 1,650 cases.)

***NOTE:** Same objective as for Misuse of Alcohol and Drugs.

— See Nutrition.

- Reduced risk factors

i. By 1990, low birth weight babies (2,500 grams and under) should constitute no more than 5 percent of all live births. (In 1978, the proportion was 7.0 percent of all births.)

j. By 1990, no county and no racial or ethnic group of the population (e.g., black, Hispanic, American Indian) should have a rate of low birth weight infants (prematurely born and small-for-age infants weighing less than 2,500 grams) that exceeds 9 percent of all live births. (In 1978, the rate for whites was about 5.9 percent, for Indians about 6.7 percent, and for blacks about 12.9 percent; rates for Hispanics are not yet separately available; rates for some other nations are 5 percent and less.)

k. By 1990, the majority of infants should leave hospitals in car safety carriers. (Baseline data unavailable.)

— See Nutrition, Family Planning, Smoking and Health, Misuse of Alcohol and Drugs, Sexually Transmitted Diseases, Immunization, Occupational Safety and Health, Toxic Agent Control, and Accident Prevention and Injury Control.

- Increased public/professional awareness

l. By 1990, 85 percent of women of childbearing age should be able to choose foods wisely (state special nutritional needs of pregnancy) and understand the hazards of smoking, alcohol, pharmaceutical products and other drugs during pregnancy and lactation. (Baseline data unavailable.)

— See Nutrition, Smoking and Health, Misuse of Alcohol and Drugs, Sexually Transmitted Diseases, Immunization, Occupational Safety and Health, and Toxic Agent Control.

- Improved services/protection

m. By 1990, virtually all women and infants should be served at levels appropriate to their need by a regionalized system of primary, secondary and tertiary care for prenatal, maternal and perinatal health services. (In 1979, approximately 12 percent of births occurred in geographic areas served by such a system.)

n. By 1990, the proportion of women in any county or racial or ethnic groups (e.g., black, Hispanic, American Indian) who obtain no prenatal care during the first trimester of pregnancy should not exceed 10 percent. (In 1978, 40 percent of black mothers and 45 percent of American Indian mothers received no prenatal care during the first trimester; percent of Hispanics is unknown.)

o. By 1990, virtually all pregnant women at high risk of having a fetus with a condition diagnosable *in utero*, should have access to counseling and information on amniocentesis and prenatal diagnosis, as well as therapy as indicated. (In 1978, about 10 percent of women 35 and over received amniocentesis. Baseline data are unavailable for other high risk groups.)

p. By 1990, virtually all women who give birth should have appropriately-attended, safe delivery, provided in ways acceptable to them and their families. (In 1977, less than .3 percent of births were unattended by a physician or midwife. Furthermore, of births which are attended by a physician or midwife, an unknown share are not considered satisfactory by the women or their families.)

q. By 1990, virtually all newborns should be provided neonatal screening for metabolic disorders for which effective and efficient tests and treatments are available (e.g., PKU and congenital hypothyroidism). (In 1978, about 75 percent of newborns were screened for PKU; about 3 percent were screened for hypothyroidism in the early 1970's, with the rate now rapidly increasing.)

r. By 1990, virtually all infants should be able to participate in primary health care that includes well child care; growth development assessment; immunization; screening, diagnosis and treatment for conditions requiring special services; appropriate counseling regarding nutrition, automobile safety, and prevention of other accidents such as poisonings. (Baseline data unavailable.)

— See Nutrition, Immunization, Accident Prevention and Injury Control.

- Improved surveillance/evaluation systems

s. By 1990, a system should be in place for comprehensive and longitudinal assessment of the impact of a range of prenatal factors (e.g., maternal exposure to radiation, ultrasound, dramatic temperature change, toxic agents, smoking, use of alcohol or drugs, exercise, or stress) on infant and child physical and psychological development.

4. Principal Assumptions

- Assurances of participation in essential services will be enhanced by various programs of outreach and by communication with client groups to achieve styles of service that are appropriate and acceptable to different populations, and by initiating or expanding publicly sponsored programs of care as may be necessary for people who are not reached by private and traditional provider systems
- Current efforts to ensure an adequate supply of food will be continued and extended (WIC and food stamps).
- Information will be routinely provided to pregnant women on serum alphafetoprotein screening; screening will be provided for medical, obstetric, psychosocial and genetic risks, and participation assured in appropriate levels of diagnosis, support and treatment.
- Prenatal care will routinely include education on avoidable risks to maternal and fetal health during pregnancy, and to infant health following birth.
- Perinatal and infant care will include but not be limited to:
  — nutritional education and supplementation as

needed, including preparation and support for breastfeeding (See Nutrition);
- psychosocial supports which promote parenting behavior conducive to parent-child attachment,
- promotion of lifestyles that encourage good parental, infant and child health practices;
- linkages that assure antenatal identification of risks, risk reduction activities and completed plans for participation in appropriate intrapartum and continuing infant care;
- provision of Rhesus immune globulin to all Rh negative women, not previously sensitized, who have a known or presumed Rh positive pregnancy.

- Achieving objectives that deal with mortality and low birth weight presumes participation in comprehensive services that will also work to reduce maternal and infant morbidity associated with lifestyle and environmental risks, including:
  - alcohol and drug use;
  - smoking;
  - management of parental stress;
  - toxic substances during pregnancy and lactation;
  - occupational safety and health;
  - prevention of infant and child accidents;
  - See Misuse of Alcohol and Drugs, Smoking and Health, Control of Stress and Violent Behavior, Toxic Agent Control, Occupational Safety and Health, Accident Prevention and Injury Control.
- Reduction of unwanted and unintended pregnancies will achieve reduction of pregnancies in teenage and late childbearing years, and will concentrate childbearing during optimum maternal ages. Efforts to reduce unwanted pregnancies are presumed to provide for:
  - education on sex, family life and reproductive health;
  - ready access to all forms of family planning services;
  - ready access to pregnancy testing, with associated counseling and referral;
  - See Family Planning.
- All needful infants and families will participate in support services (e.g., food supplementation, income supports, day care, minimum housing) that are defined by National standards which assure equity.
- All pregnant women will have access to regionalized systems of maternity care which assure services appropriate to need.
- Agencies receiving public funds related to health care—including Federal, State and local units of government, private agencies, and quasi-public agencies such as HSAs—will adopt these or more stringent objectives, and will document their progress toward meeting them.

5. Data Sources

a. To National level only

- Health Interview Survey (HIS). Smoking and drinking prevalence among women of childbearing age. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 10, selected reports, and NCHS *Advance Data from Vital and Health Statistics*, selected reports. Continuing household interview survey; National probability samples.
- Hospital Discharge Survey (HDS). Deliveries in hospital. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 13, selected reports. Continuing survey, National probability sample of short-stay hospitals.
- National Ambulatory Care Survey (NAMCS). Visits to private physicians for prenatal care. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 13, selected reports. Continuing survey; National probability sample office-based physicians.
- National Reporting System for Family Planning Services (NRSFPS). Visits to family planning clinics. DHHS-NCHS. Annual Reports. Continuous sample survey since June 1977; continuous full count reporting from 1972 to June 1977.
- National Natality Follow Back Survey. Selected data from 1964-66 Follow Back. NCHS *Vital and Health Statistics*, Series 22. Survey of mothers with legitimate live births; sample of birth records.
- 1980 National Natality Survey/1980 National Fetal Mortality Survey. Birth and fetal deaths by numerous characteristics not available from the Vital Registration System. DDHS-NCHS. Currently in the field. Public use data tapes will be available from the survey. National sample survey.
- National Survey of Family Growth (NSFG). Characteristics of women of childbearing age. DHHS-NCHS . . . NCHS *Vital and Health Statistics*, Series 23, selected reports, and *Advance Data from Vital and Health Statistics*, selected reports. Periodic surveys at intervals of several years; National probability sample.

b. To State and/or local level

- National Vital Registration System
  - Natality: Births by age, race, parity, marital status. Most States also have number of prenatal visits, timing of first prenatal visit, educational level of mother, sometimes of father. DHHS-NCHS. NCHS *Vital Statistics of the United States*. Vol. 2, and *Monthly Vital Statistics Reports*, Series 21. Continuous reporting by States; full count of birth certificates 38 States, 50 percent sample sample remaining States. (Many States issue their own earlier reports).
  - Mortality. Deaths (including infant and fetal

deaths) by age at death, sex, race. Some States link mortality and natality thus making full natality data available. DHHS-NCHS. *Vital Statistics of the United States,* Vol. 1, parts A and B; and NCHS *Monthly Vital Statistics Report* by States, Series 21, selected reports. Continuous reporting by States, all events. (Many States issue their own earlier reports.)

- Hospitalized illness discharge abstract systems.
  - — Professional Activities Study (PAS). Patients in short stay hospitals; patient characteristics, deliveries, diagnoses of congenital anomolies, procedures performed, length of stays. Commission on Professional and Hospital Activities, Ann Arbor, Michigan. Annual reports and tapes. Continuous reporting from 1900 CPHA member hospitals; not a probability sample, extent of hospital participation varies by State.
  - — Other hospital discharge systems as locally available.
  - — Selected health data. DHHS-NCHS. NCHS *Statistical Notes for Health Planners.* Compilations and analysis of data to State level.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and county level from various sources. DHHS-Health Resources Administration. *Area Resource File—a Manpower Planning and Research Tool,* DHHS HRA-80-4, Oct 79. One time compilation.

IMMUNIZATION

1. Nature and Extent of the Problem

Vaccines are among the safest and most effective measures for the prevention of infectious and communicable diseases. Introduction and widespread use of vaccines have resulted in global eradication of smallpox and in dramatic declines in the incidence of diphtheria, measles, mumps, pertussis (whooping cough), polio, rubella and tetanus. Although efforts to vaccinate increasingly higher proportions of target populations have been successful in recent years, continued activities are required to complete the task. Moreover, continued vigilance is required to maintain past successes in avoiding illnesses and deaths from these diseases, since, with the exception of smallpox, the causal agents have not been eliminated and the risk continues. Full implementation of influenza immunization, and new vaccines as they are developed, imposes a continuing challenge since the target populations (such as for a sexually transmitted diseases vaccine) may be different from those presently receiving vaccines.

a. Health implications

- Cessation of vaccination would inevitably lead to the recurrence of annual epidemics, for example, of measles, rubella, diphtheria, and mumps, as well as periodic epidemics of polio and greater incidence of tetanus.
- During periodic pandemics, thousands of people may die prematurely as a result of influenza. Between these pandemics, excess mortality due to influenza may also be in the thousands. Those primarily affected are the chronically ill and the elderly.
- Pneumonia causes over 50,000 deaths annually and over half these deaths occur among people over 65. The risk of death from pneumonia is 2.5 times higher for those aged 65 to 74 and 10 times higher for those 75 to 84 than for the population as a whole.

b. Status and trends

- From the years of their initial development to the present, the various immunizations have brought global eradication of smallpox and sharp declines in morbidity and mortality from other diseases:
  - — diphtheria—approximately 160,000 cases and 10,000 deaths or more annually in the early 1920s; 59 cases in 1979 and 4 deaths in 1978 (most recent year for which data are available);
  - — whooping cough—approximately 200,000 cases and approximately 5,000 deaths annually in the early 1930s; 1,617 cases in 1979 and 6 deaths in 1978;
  - — polio—21,000 cases of paralytic polio in 1952 (epidemic year); 26 cases in 1979;
  - — mumps—152,000 cases in 1968; 14,225 in 1979;
  - — rubella—60,000 cases in 1969, 11,795 in 1979;
  - — measles—480,000 cases in 1962; 13,597 cases in 1979.
- Morbidity from influenza and pneumonia is not reportable, so trends cannot be determined.
- With the dramatic reduction of vaccine preventable diseases, the rare adverse effects of immunization have become increasingly visible.
- An effective system for assuring that routine immunizations are delivered to susceptible populations has not yet been established nationwide.
- Immunization is required by law for first entry into school in all 50 States and the District of Columbia.
- Liability associated with vaccines, and compensation of those injured as a result of immunization, have emerged as issues in the effective delivery of services.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - — providing useful immunization information to all mothers and new parents by hospitals, physicians and others;
  - — aiming educational programs at members of the health care professions;
  - — including discussion of immunization and preventive measures in school health curricula;
  - — enlisting day care centers, senior citizen centers and churches to provide immunization information to parents and to older people;
  - — using the mass media for immunization activities;
  - — continuing use of volunteers.
- Service measures include:

- adopting standardized official immunization records;
- developing and using "tickler" and recall systems to ensure that children return for immunizations on schedule;
- reviewing records to identify children needing immunizations;
- making immunizations available without financial barriers in all health care settings as a part of comprehensive health services;
- providing information and immunization services to special populations such as immigrants and non-English speaking groups;
- continuing use of volunteers.

- Legislative and regulatory measures include:
  - enforcing existing school immunization requirements and extending them to include children at all grade levels in both public and private schools, as well as in organized preschool settings;
  - including consideration of coverage of immunization as a Medicare benefit;
  - requiring carriers under any National health insurance plan to reimburse for immunization services;
  - requiring immunization as a condition of employment (e.g., in health care institutions and for school age employees);
  - requiring rubella immunization as a service routinely offered in family planning clinics, primary care clinics, hospitals (particularly post-partum settings) and HMOs.
- Economic measures include:
  - reimbursing for immunizations under public and private health insurance plans;
  - providing vaccine free to all health care providers as long as they do not charge for it;
  - providing economic incentives to health care providers and vaccine recipients.

b. Relative strength of the measures

- The uniform and forceful implementation of school immunization requirements is one of the most effective means of improving immunization levels currently available. Enforcement of such requirements to the point of exclusion from school has resulted in the highest achievable immunization levels of school children and the lowest reported levels of diseases such as measles. One problem with this measure is that it does not assure that all preschool children are adequately immunized before the time of entry to school. Other potential regulatory measures, such as immunization requirements for employment in hospitals, address specific problems in selected population groups and are less effective.
- Continuing education and motivation of the general public and health providers about the need to continue routine immunization and the accompanying need to accept the minimal risk of severe complications associated with some vaccines are essential to maintain and extend prevention of these diseases. Experience developed from the recent Childhood Immunization Initiative has demonstrated the importance of mass media and volunteer promotion of routine immunization to parents and children.

3. Specific Objectives for 1990 or Earlier

- Improved health status

a. By 1990, reported measles incidence should be reduced to less than 500 cases per year—all imported or within two generations of importation. (In 1979, there were 13, 597 measles cases reported.)

b. By 1990, reported mumps incidence should be reduced to less than 1,000 cases per year. (In 1979, there were 14,225 mumps cases reported.)

c. By 1990, reported rubella incidence should be reduced to less than 1,000 cases per year. (In 1979, there were 11,795 rubella cases reported.)

d. By 1990, reported congenital rubella syndrome incidence should be reduced to less than 10 cases per year. (In 1979, there were 62 new cases of congenital rubella syndrome.)

e. By 1990, reported diphtheria incidence should be reduced to less than 50 cases per year. (In 1979, there were 59 diphtheria cases reported.)

f. By 1990, reported pertussis incidence should be reduced to less than 1,000 cases per year. (In 1979, there were 1,617 pertussis cases reported.)

g. By 1990, reported tetanus incidence should be reduced to less than 50 cases per year. (In 1979, there were 81 tetanus cases reported.)

h. By 1990, reported polio incidence should be less than 10 cases per year. (In 1979, there were 26 polio cases reported.)

- Increased public/professional awareness

i. By 1990, all mothers of newborns should receive instruction prior to leaving the hospital or after home births on immunization schedules for their babies. (Baseline data unavailable.)

- Improved services/protection

j. By 1990, at least 90 percent of all children should have completed their basic immunization series by age 2—measles, mumps, rubella, polio, diphtheria, pertussis and tetanus. (In 1978, completion varied from 50 to 90 percent.)

k. By 1990, at least 95 percent of children attending licensed day care facilties and kindergarten through 12th grade should be fully immunized. (Based on data collected during the 1978–1979 school year, the immunization level for measles, rubella, polio and DTP was about 90 percent for first school entrants, lower overall.)

l. By 1990, at least 60 percent of high risk populations as defined by the Immunization Practices Advisory Committee of the Public Health Service (ACIP) should be receiving annual immunization against influenza. (In 1979, about 20 percent of high risk populations were immunized.)

m. By 1990, at least 60 percent of high risk populations, as defined by the ACIP, should have received vaccination against pneumococcal pneumonia. (Baseline data unavailable.)

*n. By 1990, at least 50 percent of people in populations designated as targets by the ACIP should be immunized within 5 years of licensure of new vaccines for routine clinical use.

***NOTE:** Same objective as for Surveillance and Control of Infectious Diseases. Potential candidates include: hepatitis A and B; otitis media (*S. pneumoniae* and *H. influenza*); selected respiratory and enteric viruses; meningitis (group B *N. meningitides, S. pneumoniae, H. influenza*).

o. By 1985, the Nation should have a plan in place to mount mass immunization programs in the face of possible epidemics of influenza or other epidemic diseases for which vaccines may exist.

p. By 1990, no comprehensive health insurance policies should exclude immunizations. (Baseline data unavailable.)

- Improved surveillance/evaluation systems

q. By 1990, at least 95 percent of all children through age 18 should have up-to-date official immunization records in a uniform format using common guidelines for completion of immunization. (Baseline data unavailable.)

r. By 1990, surveillance systems should be sufficiently improved that (1) at least 90 percent of those hospitalized, and 50 percent of those not hospitalized, with vaccine preventable diseases of childhood are reported, and that (2) uniform case definitions are used nationwide. (Baseline data unavailable.)

4. Principal Assumptions

- Support for immunization activities in the private sector will remain at least as high as in 1978–79.
- In the public sector, local, State and Federal support will maintain immunization activities at least at current levels.
- Issues of vaccine liability and compensation of individuals damaged by vaccine—which have occasionally hampered immunization activities—will be resolved, or at least will not worsen. Procedures for informing recipients of the risks and benefits of vaccines will not become more complex and may be simplified. Any worsening in these areas would jeopardize attainment of the objectives.
- Vaccines will continue to be available in the quantities needed, in a timely fashion, and with no extraordinary increase in cost.
- No hitherto-unknown serious adverse reactions will appear which will affect vaccine acceptability.
- Immunity induced by recently introduced vaccines (e.g., measles, mumps and rubella) will prove to be permanent. Immunity will be induced in well over 90 percent of recipients.
- Schools will continue active involvement and strict enforcement of immunization requirements; no legal challenges to this approach will be successful.
- Use of multiple antigen vaccines (e.g., combined measles-mumps-rubella) will be standard procedure.
- Support for the development and testing of new and improved vaccines will continue at least at present levels. Current difficulties in recruiting volunteers for vaccine trials will be resolved.

5. Data Sources

a. To National level only

- National Ambulatory Medical Care Survey (NAMCS). Patient visits to physicians by patient and physician characteristics, diagnosis, patient's reasons for the visit and services provided, including immunization. DHHS-National Center for Health Statistics (NCHS). NCHS *Vital and Health Statistics*, Series 13, selected reports, and NCHS *Advance Data from Vital and Health Statistics*. Continuing; National probability sample physician's office based practices since 1973.
- Health Interview Survey (HIS). Interview respondents reports of illness (including childhood communicable diseases, influenza, pneumonia), disability, use of hospital, medical, dental, and other services, and other health-related topics. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 10. Continuing survey; household interviews, National probability sample.
- Health and Nutrition Examination Survey (HANES). Immunization status; serologic data. DHHS-NCHS. HANES I, 1971–1974; HANES II, 1979. NCHS *Vital and Health Statistics*, Series 10. Periodic surveys, data obtained from physical examinations, National probabiilty samples.
- U.S. Immunization Survey (USIS). Percentages of individuals immunized with DTP, TOPV, measles, rubella and mumps vaccines by age and socioeconomic status. DHHS-Center for Disease Control (CDC). Survey; National subsample of households interviewed for the Current Population Survey of the U.S. Census. United States Immunization Survey: 1979. Continuing, annual.
- Vaccine distribuiton system. Distribution of vaccines by antigen. DHHS-CDC. CDC Biologics Surveillance Report. Quarterly. Continuing; reports from vaccine manufacturers.
- Vaccines administered. Doses of vaccines administered in the public sector. DHHS-CDC. CDC Memoranda to State and local health departments. Continuing; quarterly reporting from State and local immunization programs.
- Adverse Reaction Monitoring System (ARMS). Adverse reactions to vaccination. DHHS-CDC. Surveillance report. Continuous reporting from State and local immunization programs.

- School Entry Immunization Survey. Immunization status of children on entry to kindergarten or first grade. DHHS-CDC. Memoranda to State and local health departments. Annual reporting from State and local immunization programs.
- Preschool immunization surveys. Immunization status of preschool children. DHHS-CDC. Memoranda to State and local health departments. Annual or as needed. Survey of day care centers and other surveys of 2 year old children by State and local immunization programs.

b. To State and/or local level

- National Vital Registration System
  - Mortality. Deaths by cause (including diseases preventable by immunization), age, sex and race. DHHS-NCHS. NCHS *Vital Statistics of the United States*, Vol. II, and NCHS *Monthly Vital Statistics Reports*. Continuing reporting from States; National full count. (Many States issue earlier reports.)
- Hospitalized illness discharge abstract systems
  - Medicare hospital patient reporting system (MEDPAR). Characteristics of Medicare patients, diagnoses, procedures. DHHS-Health Care Financing Administration-Office of Research, Demonstrations and Statistics (ORDS). Periodic reports. Continuing reporting from hospital claim data; 20 percent sample.
  - Other hospital discharge systems as locally available.
- Selected health data. DHHS-NCHS. NCHS *Statistical Notes for Health Planners*. Compilations and analysis of data to State level.
- National Morbidity and Mortality Reporting System. Numbers of 46 reportable diseases; deaths in 121 U.S. cities. DHHS-CDC. CDC *Morbidity and Mortality Weekly Report*, and annual reports. Morbidity: continuous reporting from State health departments on basis of physician reports. (Completeness of reporting varies greatly, since not all cases receive medical care and not all treated conditions are reported.) Mortality: continuous reporting from volunteer panel of health departments in 121 U.S. cities, full count.
- Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) reporting system. Immunization status and referral of children screened. DHHS-Health Care Financing Administration (HCFA), Office of Research, Demonstration and Statistics. *Medicaid Statistics*, selected reports. Continuing reporting from State Medicaid files.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and county level from various sources. DHHS-Health Resources Administration (HRA). HRA *Area Resource File: A Manpower Planning and Research Tool*. DHHS-HRA-80-4, Oct 79. One time compilation.

SEXUALLY TRANSMITTED DISEASES

1. Nature and Extent of the Problem

Sexually transmitted diseases (STDs) are infections grouped together because they spread by transfer of infectious organisms from person to person during sexual contact. Sexually transmitted diseases are major public health problems because they cause enormous human suffering, cost hundreds of millions of dollars and impose tremendous demands on medical care facilities. The sexually transmitted disease problem is rooted in apathy and ignorance. Neglect is widespread, dehumanizing and institutionalized in the public and private sectors, including educational settings ranging from public schools to those for the health professions. Women and children bear an inordinate share of the sexually transmitted disease burden: sterility, ectopic pregnancy, fetal and infant deaths, birth defects and mental retardation. Cancer of the cervix may be linked to sexually transmitted Herpes II virus.

a. Health implications

- The most serious complications caused by sexually transmitted agents are pelvic inflammatory disease, infant pneumonia, infant death, birth defects and mental retardation.
- Pelvic inflammatory disease is the most serious complication from gonorrhea and chlamydial infections. More than 850,000 cases are diagnosed and treated each year; the major proportion of these are associated with past or present sexually transmitted diseases. In 1978, it was estimated that 150,000 new cases of pelvic inflammatory disease were caused by gonorrhea. In addition:
    - — half of all women hospitalized for pelvic inflammatory disease are less than 25 years of age; sterility due to pelvic inflammatory disease currently affects over 50,000 women annually and is increasing;
    - — over 35,000 ectopic pregnancies occur each year resulting in danger to the woman's life; many of these result from the long-term effects of pelvic inflammatory disease;
    - — pelvic inflammatory disease yearly accounts for over 250,000 hospitalizations and over 50,000 major surgical procedures, many involving total removal of the reproductive organs.
- Chlamydia causes an estimated 50,000 eye infections and 25,000 cases of pneumonia per year in infants.
- Genital herpes infections are very common, with an incidence of one-half to one million new cases annually, with several million recurrences each year, and:
    - — no effective treatment is currently available for this painful condition; periodic recurrences are the rule;
    - — herpes-complicated pregnancies often result in abortion, stillbirth or severe neonatal infection; neonatal herpes results in death or permanent disability in two-thirds of the cases.
- Hepatitis B is caused by a virus with many different modes of transmission, including sexual transmission. Homosexual men are at very high risk; nearly 60 percent attending sexually transmitted disease clinics show evidence of past or present Hepatitis B infection. This same population is also at high risk of several other sexually transmitted diseases, including amebiasis and giardiasis.
- These and other sexually transmitted diseases have placed great strain upon the resources of local health departments during the 1970s.

b. Status and trends

- Total costs for sexually transmitted diseases vastly exceed one billion dollars annually.
- Costs for the most common reported sexually transmitted disease, gonorrhea, were estimated to total over $770 million in 1978.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
    - — education and training, including clinical experience in schools for health professionals;
    - — education and information about sexually transmitted diseases for school children before, and during, the time they are at highest risk;
    - — pre-service and continuing professional education for both health providers and health educators to deal with sexually transmitted diseases in a confidential, non-judgmental fashion;
    - — improved public understanding of sexually transmitted disease risks and confidentiality

of treatment through effective and continuous campaigns using mass media; the measures may be directed to wide populations or targeted to special groups such as adolescents, homosexuals, women with pelvic inflammatory disease and other risk groups;
  - — counseling of patients being treated for sexually transmitted diseases regarding complications and measures to avoid future infection;
  - — use of peers, who are often adjuncts to educate and counsel adolescents about sexually transmitted diseases.
- Service measures include:
  - — provision of diagnostic and treatment services for the sexually transmitted diseases and their complications;
  - — counseling infected patients and tracing and treating their contacts;
  - — screening for selected sexually transmitted diseases;
  - — encouraging joint availability of services among related programs such as sexually transmitted diseases, family planning and maternal and child health.
- Technologic measures include:
  - — properly used condoms as the best known measure for persons engaging in sexual activity to avoid acquiring or transmitting many of the sexually transmitted diseases;
  - — a vaccine for Hepatitis B (being tested for efficacy); vaccines for gonorrhea and genital herpes (at an earlier stage of development).
- Legislative and regulatory measures include:
  - — Health Systems Agencies (HSAs) determining the magnitude of the sexually transmitted disease problem and establishing objectives for inclusion in their Annual Implementation Plans (AIPs);
  - — State Health Planning and Development Agencies (SHPDAs) making certain that the State health plan addresses gaps in education and service delivery regarding sexually transmitted diseases;
  - — examination of health professionals' knowledge of sexually transmitted diseases and competency in dealing with sexually transmitted diseases by specialty boards, certifying agencies and other regulatory boards;
  - — establishment of a comprehensive review rating and accreditation to evaluate and maintain the quality of STD care and services;
  - — State and local governments repealing statutes and ordinances which inhibit the advertising, display, sale or distribution of condoms;
  - — regulations mandating information about sexually transmitted diseases as part of school health education programs.
- Economic measures include:
  - — sexually transmitted disease services, as with other prevention-related activities, being exempted from coinsurance or deductible provisions of health insurance;
  - — prepaid health plans receiving financial incentives for sexually transmitted disease prevention activities including management of contacts who are not members of the plan.

b. Relative strength of the measures

- Readily available quality clinical services without stigma form a necessary foundation for other clinic-related prevention activities.
- Early diagnosis and treatment of sexually transmitted diseases among patients attending clinics, contacts and those identified in screening programs are highly effective in preventing transmission of the diseases and in limiting their disabling complications.
- Persons who properly and consistently use condoms experience lower rates of sexually transmitted diseases.
- As vaccines are developed and introduced, they can be effectively administered in the health care system.
- Mass and targeted education and information measures appear to be the only way to modify hardened public opinion and reduce sexually transmitted disease ignorance and apathy.
- Education and training of health professionals and health educators is a necessary first step toward effective sexually transmitted disease service measures.

3. Specific Objectives for 1990 or Earlier

- Improved health status

a. By 1990, reported gonorrhea incidence should be reduced to a rate of 280 cases per 100,000 population. (In 1979, the reported case rate was 457 per 100,000 population.)

b. By 1990, reported incidence of gonococcal pelvic inflammatory disease should be reduced to a rate of 60 cases per 100,000 females. (In 1978, the estimated rate was 130 cases per 100,000 females.)

c. By 1990, reported incidence of primary and secondary syphilis should be reduced to a rate of 7 cases per 100,000 population per year, with a reduction in congenital syphilis to 1.5 cases per 100,000 children under 1 year of age. (In 1979, the reported incidence of primary and secondary syphilis was 11 cases per 100,000 population while reported congenital syphilis was 3.7 cases per 100,000 children under 1 year of age.)

d. By 1990, the incidence of serious neonatal infection due to sexually transmitted agents, especially herpes and chlamydia, should be reduced to a rate of 8.5 cases of neonatal disseminated herpes per 100,000 children under 1 year of age, and a rate of 360 cases of chlamydial pneumonia per 100,000 children under 1 year of age. (In 1979, about 16.8 cases of neonatal disseminated herpes per 100,000 children under 1 year of age and about 720 cases of chlamydial pneumonia per 100,000 children under 1 year of age were estimated to have occurred.)

e. By 1990, the incidence of nongonococcal urethritis and chlamydial infections should be reduced to a rate of 770 cases per 100,000 population. (In 1979, the case rate was estimated to be 1,140 per 100,000 population.)

- Reduced risk factors

f. By 1990, the proportion of sexually active men and women protected by properly used condoms should increase to 25 precent of those at high risk of acquiring sexually transmitted diseases. (In 1979, the estimated proportion was less than 10 percent.)

- Increased public/professional awareness

g. By 1990, every junior and senior high school student in the United States should receive accurate, timely education about sexually transmitted diseases. (Currently, 70 percent of school systems provide some information about sexually transmitted diseases, but the quality and timing of the communication varies greatly.)

h. By 1985, at least 95 percent of health care providers seeing suspected cases of sexually transmitted diseases should be capable of diagnosing and treating all currently recognized sexually transmitted diseases, including: genital herpes diagnosis by culture, therapy (if available) and patient education; hepatitis B diagnosis among homosexual men, prevention through a vaccine (when proved effective), and patient education; and nongonococcal urethritis diagnosis, therapy and patient education. (Baseline data unavailable.)

- Improved services/protection

i. By 1990, at least 50 percent of major industries and Governmental agencies offering screening and health promotion programs at the worksite should be providing sexually transmitted disease services (education and appropriate testing) within those programs. (Baseline data unavailable.)

- Improved surveillance/evaluation systems

j. By 1985, data should be available in adequate detail (but in statistical aggregates to preserve confidentiality) to determine the occurrence of nongonococcal urethritis, genital herpes and other sexually transmitted diseases in each local area, and to recommend approaches for preventing sexually transmitted diseases and their complications.

k. By 1990, surveillance systems should be sufficiently improved that at least 25 percent of sexually transmitted diseases diagnosed in medical facilities are reported, and that uniform definitions are used nationwide. (Baseline data unavailable.)

4. Principal Assumptions

- Biologic changes in the sexually transmitted disease organisms are likely but unpredictable as to their occurrence or effect, therefore they have not been considered.
- The size of the at-risk sexually-active population is not expected to change substantially during the 1980s. (Declines in younger age groups are expected to be balanced by increases in nonmonogamous sexual activity in all groups.)
- During the next decade, the health planning process will provide the opportunity to influence providers to raise norms and meet guidelines for prevention and management of sexually transmitted diseases. HSAs will include sexually transmitted diseases among other health status indicators, and will include sexually transmitted disease objectives and control measures in their plans.
- All health professional training programs will give greater emphasis to the prevention, early diagnosis and treatment of sexually transmitted diseases.
- Medical schools will establish clinical affiliations with public and private sexually transmitted disease facilities so that all medical students and physicians in training will receive supervised clinical experience in the diagnosis and treatment of sexually transmitted diseases.
- Support for studies of mechanisms of antibiotic resistance and for the development of antiviral drugs and new vaccines will continue at 1979 levels.

5. Data Sources

a. To National level only

- Annual Census of State and County Mental Hospitals. Resident patients and new admissions to mental institutions; costs, diagnoses of syphilitic psychoses. DHHS-Alcohol Drug and Mental Health Administration, National Institute of Mental Health (NIMH). *Mental Health Statistical Notes*, selected issues; special reports and tabulations furnished to the Center for Disease Control (CDC), Venereal Disease Control Division. Continuing; National sample surveys of patients in State and county mental hospitals.
- National Ambulatory Medical Care Survey (NAMCS). Patient characteristics, diagnoses of STD. DHHS-National Center for Health Statistics (NCHS). NCHS *Vital and Health Statistics*, Series 13, selected reports, and CDC, Division of Venereal Disease Control, special tabulation from tapes provided by NCHS. Continuing; National probability sample, office-based physicians.
- Health and Nutrition Examination Survey (HANES). Adults, patient characteristics, serio-

logic tests for syphilis, urine cultures for gonorrhea. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 11, selected reports. Periodic surveys; National probability sample.

- Hospital Discharge Survey (HDS). Patient stays in short-stay hospitals, patient characteristics, diagnoses, including salpingitis and PID; surgery and other procedures; length of stay. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 13, selected reports, and special tabulations by CDC, Venereal Disease Control Division from tapes provided by NCHS. Continuing survey; National probability sample of short stay hospitals.
- STD Surveillance. Nonreported as well as reported STDs. Patient visits to VD clinics; age, race, sex, reason for attendance, sexual preference, laboratory tests and results, diagnoses of 14 of the sexually transmissible diseases. DHHS-CDC, Venereal Disease Control Division. Inhouse summaries provide part of basis for National incidence/prevalence estimates of STD in *STD Fact Sheet*, HEW Publication No. (CDC) 8195, and other program documentations. Continuing reporting; full count from 7 STD clinics.
- Gonorrhea Therapy Monitoring Network. Gonorrhea patients treated with a variety of antibiotics in varying dosages; post treatment results, minimum inhibitory concentration of antibiotics. DHHS-CDC, Veneral disease Control Division. Supplement to *Sexually Transmitted Diseases* (Journal of the American Venereal Disease Association) Vol. 6, No. 2, April-June 1979. Continuing 1971–1979; discontinued 1979.
- The Hepatitis B Collaborative Study. Hepatitis incidence and prevalence among male homosexuals; sexual behavior modalities. DHHS-CDC, Venereal Disease Control Division and Hepatitis Laboratories Division. Results in preparation. One time study from five clinics.

b. To State and/or local level

- National Case Reporting System (NCRS). Reported cases of gonorrhea, syphilis by stage, chancroid, granuloma inguinale and lymphogranuloma; age, race, sex and reporting source (private vs. public). DHHS-CDC, Bureau of Epidemiology and Venereal Disease Control Division. *STD Fact Sheet*, Publication No. (CDC) 8195; *Sexually Transmitted Disease (STD) Statistical Letter*. Continuing full National count of reported cases, State and major city breakdown, additional characteristics, e.g., marital status, may be locally available in some States.
- Hospitalized illness from discharge abstract systems
  - — Professional Activities Study (PAS). Patient stays in short-stay hospitals; patient characteristics, diagnoses of salpingitis and PID. Commision on Professional and Hospital Activities (CPHA), Ann Arbor, Michigan. Special tabulations and/or tapes provided to DHHS–CDC, Venereal Disease Control Division. Continuing reporting from discharge records. Full count of patients discharged from CPHA 1900 member hospitals. Not a probability sample. Extent of hospital participation varies by State.
  - — Other hospital discharge systems as locally available.
  - — National Morbidity and Mortality Reporting System. Numbers of 46 reportable diseases; deaths in 121 U.S. cities. DHHS–CDC. CDC *Morbidity and Mortality Weekly Report*, and anual reports. Morbidity: continuous reporting from State health departments on basis of physician reports. (Completeness of reporting varies greatly, since not all cases receive medical care and not all treated conditions are reported.) Mortality: continuous reporting; volunteer panel of health departments in 121 U.S. cities, full count.
- Quarterly Epidemiologic Activity Report (CDC 9.2127). Number of interviews by disease, contacts elicited and examined, medical disposition. DHHS–CDC, Venereal Disease Control Division. *STD Fact Sheet*, HEW Publication No. (CDC) 8195; *Sexually Transmitted Disease (STD) Statistical Letter*. Continuing reporting from State health departments; full National count with project area breakdown.
- Gonorrhea Culture Results of Females. Number women screened and positive, by type of provider. DHHS–CDC, Venereal Disease Control Division. *STD Fact Sheet*, HEW Publication No. (CDC) 8195, *Sexually Transmitted Disease (STD) Statistical Letter*. Continuing reporting from State health departments; National full count of federally sponsored gonorrhea screening activity.
- Infectious Syphilis Epidemiologic Control Record. Early syphilis interviews; age, race, sex of cases, contacts, time intervals between case report and final disposition of contacts. DHHS–CDC, Venereal Disease Control Division. *STD Fact Sheet*, HEW Publication No. (CDC) 8195; *Sexually Transmitted Diseases (STD) Statistical Letter*. Continuing reporting from State health departments; National full count.
- Results of Followup of Serologic Reactors. Reactive serologic tests reported to health departments and results of followup. DHHS–CDC, Venereal Disease Control Division. *STD Fact Sheet*, HEW Publication No. (CDC) 8195; *Sexually Transmitted Disease (STD) Statistical Letter*. Continuing reporting from State health departments; National full count.
- VD Laboratory Surveillance Report. Number

of tests for syphilis performed, number positive, type of laboratory. DHHS–CDC, Venereal Disease Control Division. *STD Fact Sheet,* HEW Publication No. (CDC) 8195; *Sexually Transmitted Disease (STD) Statistical Letter.* Continuing reporting from State health departments; National full count.

- National Vital Registration System

— Mortality. Deaths by cause (including infant deaths attributable to sexually transmissible diseases and to syphilis) by age, sex and race. DHHS–NCHS. NCHS *Vital Statistics of the United States,* Vol. II, and *NCHS Monthly Vital Statistics Reports.* Continuing reporting from States; full count. (Many States issue earlier reports.)

TOXIC AGENT CONTROL

1. Nature and Extent of the Problem

Toxic agents include, but are not limited to, natural and synthetic chemicals, dusts, minerals, and materials which produce acute or chronic illness. Such agents may be carcinogenic, mutagenic or teratogenic, and they may adversely affect the reproductive system, nervous system, or specific organs such as the liver or kidney. Included as a toxic agent for the purposes of this document are radiation exposures of various types.

a. Health implications

- Health effects attributed to toxic agents and/or radiation of various types include:
  - — acute effects, including systemic poisoning;
  - — chronic effects including teratogenic abnormalities and growth impairment;
  - — infertility and other reproductive abnormalities;
  - — skin disorders;
  - — cancer;
  - — neurologic disorders;
  - — behavioral abnormalities;
  - — immunologic damage;
  - — chronic degenerative diseases involving the lungs, joints, vascular system, kidneys, liver and endocrine organs.
- Though the extent to which toxic agents are associated with disease is not completely known, recent empirical evidence confirms that serious environmental health hazards exist. New evidence unfolds regularly, revealing previously unsuspected associations between specific environmental agents and diseases. The detection of specific etiology is greatly complicated because (a) many agents may contribute to the same diseases, (b) there may be long latency periods between exposure and disease onset, and (c) data are sometimes unavailable or inappropriately aggregated for discovery purposes.
- Diseases associated with toxic agents may differentially affect different age groups, present and future generations and groups with different histories of past exposure and predisposing conditions.
- Varying latency associated with many chronic diseases, complex history of previous exposure and other factors mentioned above make assessment of the magnitude of the problem difficult. Although current disease incidence and mortality data are inaccurate measures, they serve as indicators of the effectiveness of existing control and prevention efforts.
- Objective laboratory measurements of toxicity, levels of concentrations, and human biological effects are necessary to characterize effectiveness of control mechanisms and to define biochemical sequelae of toxic insults to biological systems.

b. Status and trends

- Sources of environmental health hazards presently subject to Federal regulation include:
  - — air/water emissions/effluents;
  - — hazardous waste disposal;
  - — transportation of hazardous materials;
  - — occupational exposure;
  - — products (food additives, pharmaceuticals, pesticides, consumer and industrial chemicals);
  - — radiation exposure from medical devices, consumer products, food and the environment.
- The rapid advancement of post-World War II industrial production has created substantial increases in the quantity and kinds of substances and materials which may pose significant health hazards.
- It is estimated that of the four million chemical compounds which have been synthesized or isolated from natural materials, more than 55,000 are produced commercially. Approximately 1,000 new compounds are introduced annually; pesticide formulations alone contain about 1,500 active chemical ingredients.
- There may be as many as 30,000 toxic solid waste disposal sites in the United States.
- Over 13,000 substances currently in commercial use have been identified as potentially toxic to workers, with an additional number introduced every year.
- Over 2,000 chemicals are suspected carcinogens in laboratory animals. Current epidemiologic evidence builds a convincing case for the carcinogenicity in humans of 26 chemicals and/or industrial processes.
- More than 20 agents are known to be associated

with birth defects in humans; many times this number are associated with birth defects in animals.

- Of 700 atmospheric contaminants, 47 have been identified in animal studies as recognized carcinogens, 42 as suspected carcinogens, 22 chemicals as promoters and 128 as mutagens.
- From over 2,200 contaminants of all kinds identified in water, 765 were identified in drinking water. Of these, 12 chemical pollutants were recognized carcinogens, 31 were suspected carcinogens, 18 were carcinogenic promoters and 59 were mutagens. It is not known what the additive effects of these chemicals will be on the total cancer burden.
- As water resources become in shorter supply, more and more surface water, used for drinking water, will be recycled or reprocessed, continuing the recycling of pollutants unless adequate water treatment measures are taken.
- Even if carcinogenic pesticides are no longer available for sale by 1990, some will persist in the environment, in food supplies and in human bodies for many years.
- Problems with toxic agents are not only attributable to industry, but also medical and dental care (x-rays and drugs), agriculture (pesticides and herbicides), Government (biological and chemical agents), consumers (incorrect use of consumer products which contain toxic substances) and natural sources (fungal products).
- Low levels of ionizing radiation can produce delayed effects, such as cancer, after a latent period of many years. Fifty percent of the current United States population dose comes from naturally occurring background radiation, radioactive materials in the water, soil and air, and cosmic radiation; 45 percent results from diagnostic and therapeutic medical applications. Fallout, industrial use, production of nuclear power and consumer products account for the remaining 5 percent. Thus roughly half the exposure of the population at large comes from manmade sources.
- The synergistic effects of exposures to ionizing radiation and toxic agents may greatly increase carcinogenic risks.

2. Prevention/Promotion Measures

a. Potential measures

- Many of the measures outlined below need to be carried out by environmental and health regulatory and research agencies. Mechanisms such as the Interagency Regulatory Liaison Group (IRLG) are essential to coordinate their activities in areas of:
  - — assessing agent toxicity;
  - — assessing the number of persons at risk from a particular agent and estimating intensity of exposures and conditions of exposure as they affect risk;
  - — technology assessment and development;
  - — economic impact analyses;
  - — developing generic or group standards for classes of toxic substances;
  - — pooling limited technological resources required to control environmental health hazards;
  - — establishing effective mode(s) of control for each agent.
- Education and information measures include:
  - — informing the public that exposure to hazardous agents is serious, but manageable, and that government control measures are essential;
    - – through television announcements;
    - – through establishing a system to warn consumers and workers of possible carcinogens, teratogens, or other toxic substances so that precautionary actions to prevent health effects may be exercised;
    - – through providing information on the control of environmental and occupational health hazards to teachers and students in elementary and secondary schools within the context of comprehensive mandatory classroom health education;
  - — educating health professionals and directors in industry about toxicology, epidemiology, industrial hygiene, medical surveillance, control technology design and hazardous substance control;
  - — expanding sensitivity of practicing physicians, nurses and other health professionals in the diagnosis of environmental and occupational diseases and associated reporting responsibilities;
  - — educating managers of industrial firms through both their training curricula and through continuing education (especially those trained in chemical and mechanical engineering, law and business administration);
  - — staffing the regulatory agencies with well-trained professionals, not only in the sciences, medicine and engineering, but also in policy analysis.
- Service measures include:
  - — relating diseases to toxic agent exposures and providing appropriate medical care;
  - — screening and diagnostic services for individuals with suspected exposure to toxic substances, and treatment as necessary.
- Technologic measures include:
  - —timely efforts to encourage and/or upgrade:
    - – instrumentation and laboratory operations for hazard detection and monitoring;

  - laboratory standardization programs to insure validity and interlaboratory comparability of data;
  - emission and effluent control technology;
  - hazardous and radioactive waste disposal technology;
  - manufacturing process design;
  - new product development and testing for deleterious health effects.
- Government assistance in developing control technology and process redesign where the industrial incentives or requirements for such development are lacking;
- technology to control nuclear wastes and certain classes of hazardous waste and technology to minimize transportation risks;
- technology improvements including modification of current technology and development of new diagnostic tools to reduce the amount of radiation required for medical and dental diagnosis and treatment;
- sharing of control technology information among the regulatory agencies and joint technology development among agencies to address related problems;
- technology-forcing regulatory initiatives to encourage process redesign and new product development.

- Legislative and regulatory measures include:
  - enforcement of major environmental laws controlling hazardous substances:
    - Clean Air Act;
    - Clean Water Act and the Safe Drinking Water Act;
    - Resource Conservation and Recovery Act (regulating hazardous substances disposal);
    - Toxic Substances Control Act;
    - Federal Hazardous Substances Control Act;
    - Consumer Product Safety Act;
    - Federal Environmental Pesticide Control Act;
    - The Food, Drug, and Cosmetic Act;
    - Hazardous Substances Transportation Act;
    - Atomic Energy Act;
    - National Environmental Protection Act;
    - Occupational Safety and Health Act;
    - Federal Insecticide, Fungicide, and Rodenticide Act;
    - Radiation and Safety Act.
  - ensuring the comprehensive application of these laws; certain groups of chemicals and classes of substances are now exempted from existing testing and regulatory authorities;
  - grouping of toxic agents into classes for both testing and regulatory action under all toxic substances control law; continuing to place the burden of obtaining an exemption from a class rule on the manufacturer since similar compounds can have differing toxicities;
  - labeling hazardous ingredients in trade name products, to address both the content of the product with respect to potentially hazardous substances and directions for proper use and disposal of the chemical (a prerequisite for both effective hazard recognition and the implementation of appropriate control measures);
  - full disclosure of health-related data to potentially affected parties, including toxicological and epidemiological data, *in vitro* tests, elemental analysis, molecular structure and process or synthesis information;
  - establishing priorities and developing more standards for hazardous substances in both air and water (e.g., careful attention to ambient air standards as energy programs are implemented);
  - establishing State systems for monitoring pollution from both diesel and conventionally powered vehicles;
  - expediting promulgation of regulations defining categories of hazardous materials disposal under the Resource Conservation and Recovery Act (RCRA) and coordination of their control;
  - identifying and detoxifying past hazardous substance disposal sites, and prioritizing the action taken on sites to reflect the magnitude of the public health risk;
  - requiring sufficient screening examination by the manufacturer (before marketing) for the full range of health effects for all new chemicals for which there may be potentially serious risk to health/environment;
  - withholding from introduction into commerce new chemicals that pose a significant public health threat unless the manufacturer can demonstrate that there are safe and practical methods for their manufacture, intended uses and disposal;
  - implementing expedited procedures to remove from the market consumer products containing known carcinogens, teratogens and mutagens;
  - controlling intensive use of pesticides to achieve marginal or questionable production increases;
  - implementing integrated pest management; establishing it as a condition for permits to use the more hazardous pesticides;
  - developing and implementing improved standards for transportation containers and inspection standards for vehicles and routes of transportation for hazardous substances, with particular emphasis on railroad safety;

- developing an adequate system of records of toxic substances being transported;
- establishing centralized National occupational records of radiation exposure of workers to include exposure to all types and levels of radiation, including records for part-time workers;
- establishing siting criteria for industries using radioactive materials (to preclude such events as the recent contamination of food in a grammar school cafeteria);
- establishing approved routes for transportation of nuclear fuels and nuclear wastes designed to avoid metropolitan areas and potential watershed contamination.

- Economic measures include:
  - taxation and legal redress:
    - effluent/emission taxes (using effluent/emission taxes as supplements to, and not replacements for, regulation to create additional incentives for hazard abatement);
    - favorable tax treatment of investment in pollution control;
    - legal redress for harm resulting from exposure to toxic agents.
  - tax policies encouraging capital investment in redesigning process technology to emphasize process improvement over add-on technology;
  - amending the limited liability principles applied to reactor safety by the Price Anderson Act in measures that deal with the effects of toxic substances.

b. Relative strength of the measures

- Exerting effective control in these areas by means appropriate to each is complex. Steps are required to ensure that Federal regulatory efforts are adequately coordinated, that they are anticipatory rather than reactive in dealing with the problems of a rapidly changing industrial production system and that they are appropriately attentive to protecting the public health.
- There are inherent and complicated interrelationships between regulatory and economic and technologic measures applied to protecting the public from the hazards of exposure to toxic agents.
- The most effective measures may well be technologic, but their development and application depends upon adequate regulatory support and economic incentives.
- Industry, which is the principal target of most efforts to reduce exposure to toxic agents, is most likely to be responsive to economic incentives.
- Education of the public is of particular importance, given the substantial counterpressures offered by conflicting social values (e.g. energy production) and by existing advertising efforts.
- The pressures which drive the demand for increased consumption must be reconciled with an increased demand for protection of health or the environment. Resolving these conflicting social goals has been attempted (a) by providing legislative guidelines and directives in individual environmental laws, (b) by giving extensive discretion to agency administrators, (c) by requiring economic impact statements through Presidential directives, and (d) by introduction of Federal legislation requiring regulatory impact analysis. To the present, the balancing of social goals and the fulfillment of regulatory mandates have been reviewed by the courts with unpredictable results.

3. Specific Objectives for 1990

- Improved health status
  - Improvements in the control of toxic agents can be expected over the longer term to yield reduced rates (or slowing in the rates of increase) for cancer, birth defects, respiratory disease, kidney disease, nervous system disease and other acute and chronic conditions. Because of uncertainties in the quantification of the exposure-to-disease relationship (short and long term), the statement of measurable health status objectives at this time has been limited to the two noted below.

a. By 1990, 80 percent of communities should experience a prevalence rate of lead toxicity* of less than 500/100,000 among children ages 0 to 5, especially age 0 to 1. (In 1980, the estimated prevalence of lead toxicity Nationally exceeds 1,000/100,000.)

*__NOTE:__ Lead toxicity is defined as an erythrocyte protoporphyrin level exceeding 50 ug/dl whole blood and a blood lead level exceeding 30 ug/dl.

b. By 1990, virtually no individual should suffer birth defects or miscarriage as a result of exposure to a toxic chemical disposed after implementation of the Resource Conservation and Recovery Act. (Baseline data unavailable.)

- Reduced risk factors

c. By 1990, virtually all communities should experience no more than one day per year when air quality exceeds an individual ambient air quality standard with respect to sulfur dioxide, nitrous dioxide, carbon monoxide, lead, hydrocarbon and particulate matter. (In 1979, the level was estimated to be about 50 percent.)

d. By 1990, at least 95 percent of the population should be served by community water systems that meet Federal and State standards for safe drinking water. (In 1979, the level was 85 to

90 percent for the National Interim Primary Drinking Water Standards.)

e. By 1990, there should be virtually no preventable contamination of ground water, surface water or the soil from industrial toxins associated with wastewater management systems established after 1980. (Baseline data unavailable, but EPA is starting a series of programs to prevent ground water contamination in 1980 that should show results by 1990.)

f. By 1990, there should be no pesticides, herbicides, fungicides, or rodenticides available for sale which are known to be carcinogenic, teratogenic or mutagenic in man, unless determined to be vital to the National interest under certain conditions. (Baseline data unavailable.)

g. By 1990, inhalation of fumes from toxic materials during transport of such materials should be eliminated. (Baseline data unavailable.)

h. By 1990, the number of medically unnecessary diagnostic x-ray examinations should be reduced by some 50 million examinations annually. (In 1979, the number of diagnostic x-ray examinations performed in the United States annually was 278 million, of which 83 million were estimated to be medically unnecessary.)

- Increased public/professional awareness

i. By 1990, at least 75 percent of all city council members in urban communities should be able to report accurately whether or not the quality of their air and water has improved or worsened over the decade and to identify the principal substances of concern. (Baseline data unavailable.)

j. By 1990, at least half of all adults should be able to accurately report an accessible source of information on toxic substances to which they may be exposed—including information on the interactions with other factors such as smoking and medications. (Baseline data unavailable.)

k. By 1990, at least half of all people ages 15 years and older should be able to identify the major categories of environmental threats to health and note some of the health consequences of those threats. (Baseline data unavailable.)

l. By 1990, at least 70 percent of all primary care physicians should be able to identify the principal health consequences of exposure to each of the major categories of environmental threats to health. (Baseline data unavailable.)

- Improved services/protection

m. By 1990, at least 90 percent of all children identified with lead toxicity in the 0 to 5 age group (especially those age 0 to 1) should have been brought under medical and environmental management. (Baseline data unavailable. Approximately 34,000 children ages 1 to 5 with lead toxicity are reported annually from Federally supported programs, and an estimated one percent of the U.S. population ages 1 to 5 have lead toxicity.)

n. By 1990, the Toxic Substances Control Act and the Resource Conservation and Recovery Act should be fully implemented to protect the U.S. population against hazards resulting from production, use, and disposal of toxic chemicals. (Baseline data unavailable.)

o. By 1990, individuals purchasing a potentially toxic product sold commercially or used industrially should be protected by clear labeling as to content, as to direction for proper use and disposal, and as to factors that may make that individual especially susceptible (health status, age, sex, medications, genetic traits). (Baseline data unavailable.)

p. By 1990, every individual should have access to an acute care facility with the capability to provide, or make appropriate referrals for screening, diagnosis and treatment of suspected exposure to toxic agents. (Baseline data unavailable.)

q. By 1990, every individual residing in an area of a population density greater than 20 per square mile, or an area of particularly high risk, should be protected by an early warning system designed to detect the most serious environmental hazards posing imminent threats to health. (Baseline data unavailable.)

r. By 1990, every populated area of the country should be able to be reached within 6 hours by an emergency response team in the event of exposure to an environmental hazard posing acute threats to health from a toxic agent, chemical and/or radiation. (Baseline data unavailable.)

- Improved surveillance/evaluation systems

s. By 1990, a broad scale surveillance and monitoring system should have been planned to discern and measure known environmental hazards of a continuing nature as well as those resulting from isolated incidents. Such activities should be continuously carried out at both Federal and State levels.

t. By 1990, a central clearinghouse for observations of agent/disease relationships and host susceptibility factors should be fully operational, as well as a National environmental data registry to collect and catalogue information on concentrations of hazardous agents in air, food and water.

4. Principal Assumptions

- Control and prevention measures will continue to be developed within a framework reflecting Federal regulatory efforts developed during the 1970s.
- Consumers and workers will have ready access to central information sources (like Poison Control Centers) describing major substances or products known to be toxic, their known interactions with

life style behaviors such as smoking and medications, insofar as these are known, and recommended actions to be taken.

- The capability to trace the generation, transport, disposal and ultimate fate of various agents through the various environments relevant to public health will continue to be enhanced.
- Permissible exposure levels and individual harmful levels will reflect real-world multiple exposures, the history of previous exposure, individual susceptibilities and the effects of aging, and will accommodate qualitative and quantitative differences in the health consequences of toxic substances exposures in the prenatal and perinatal periods.
- A substance-by-substance regulatory approach alone will not be able to solve a large proportion of public health problems traceable to toxic agents.
- In designing a regulatory strategy, potential health problems arising from technology will be anticipated.
- Schools for the health professions and continuing education programs will have evaluated their curricula so that by 1990 health professionals will be receiving training in toxicology and in the health consequences of environmental exposure to toxic agents.
- An integrated health education curriculum in most public school systems will include information on toxic substances, their relationship to the environment and the students' role in protecting their health.
- Control technology will have been developed for dealing with the major known toxic agents.
- Programs will be operating to replace pesticides that show high acute toxicity and/or carcinogenic or teratogenic effects by safer substances or approaches (such as integrated pest management). They will be targeted in each year to the 10 percent most hazardous materials in use.
- Transportation of toxic and radioactive materials will be fully regulated.
- State systems of mobile source monitoring for both diesel and conventionally power vehicles will be fully operational.
- The National water quality goals for 1984 of fishable and swimable water will have been met and maintained.
- Performance standards in hospital and ambulatory/patient care situations involving exposure to toxic agents will be operational.
- Sufficient penalties will be attached to toxic agent pollution to provide strong economic incentives to abate.
- Industrial investment for reducing exposure to toxic agents will receive favorable tax treatment.
- A strict liability system for industrial waste disposal will be operational.
- By 1985, a plan will have been developed to protect humans from the consequences of toxic agents in existing sites of toxic solid waste disposal. (Approximately 30,000 solid waste disposal sites may be involved. Proposed "Superfund" will be used to clean up the worst sites.)

5. Data Sources

a. To National level only

- Nationwide Evaluation of X-ray Trends (NEXT). X-ray examination dosimetry, distribution of exposure levels by type of examination, type of facility and type of equipment. DHHS-Food and Drug Administration (FDA). Periodic reports. Continuing reporting from participating State radiation control programs.
- Breast Exposure: Nationwide Trends (BENT). Mammography dosimetry, distribution of radiation exposure levels of x-ray equipment used in mammography. DHHS-FDA. Periodic reports. Continuous reporting from participating State radiation control programs.
- Dental Exposure Normalization Technique (DENT). Data on dental x-ray exposure, distribution of radiation exposure levels of dental x-ray equipment used in dental facilities. DHHS-FDA. Periodic and annual reports. Continuous reporting from participating State radiation control programs.
- Birth Defects Monitoring Program. Birth defects diagnosed at birth, by major types. DHHS-CDC. CDC quarterly report, *Congenital Malformations Surveillance Report*. Continuing analysis of data reported on hospital discharge abstracts from hospital members of the Professional Activities Study (PAS), Commission on Professional Hospital Activities. (Not a random sample of hospitals.)
- National Occupational Hazard Survey. Inventory of work hazards. DHHS–CDC, National Institute for Occupational Safety and Health (NIOSH). *National Occupational Hazard Survey Records,* Vol. 1–4, 1974–1979. Survey will be updated 1980–82. Data obtained from onsite inspections of 800 industrial facilities, 1972–79.
- Health and Nutrition Examination Survey (HANES). Levels of various toxic agents in blood obtained from laboratory tests. DHHS, NCHS. HANES II, 1979. Reports will appear in NCHS *Vital and Health Statistics,* Series 10.
- Toxic Effects. Listing of chemical substances for which toxic effects have been reported. DHHS-CDC, NIOSH. NIOSH *Reports of Toxic Effects of Chemical Substances*. Annual reports derived from findings reported in journal literature.

b. To State and/or local level

- Early and Periodic Screening, Diagnosis and Treatment (EPSDT) reporting system. Lead poisoning detected among children screened, and referral. DHHS-Health Care Financing Administration (HCFA), Office of Research, Demonstrations and Statistics (ORDS). *Medicaid Statistics*, selected reports. Continuous reporting from State Medicaid offices.

- Lead based paint poisoning prevention. Number children screened for lead toxicity, number positive, number brought under environmental and medical management in participating areas. CDC Laboratory Quarterly Report, *Surveillance of Childhood Lead Poisoning, United States*. DHHS-CDC. Quarterly report. Continuous reporting from States.
- Surveillance, Epidemiology and End Result Program (SEER). Cancer incidence, morbidity and survival. DHHS-National Institutes of Health, National Cancer Institute. Periodic reports from cancer registries, selected geographic areas.
- National Aerometric Bank (NADB). Measurements on the five pollutants for which National Ambient Air Quality standards have been set. Environmental Protection Agency (EPA). *National Air Quality Monitoring and Emissions Trends Report*, 1977, and continuing reports. Research Triangle Park, N.C. Continuing reporting, quarterly, from 3,400 pollution control agencies.

OCCUPATIONAL SAFETY AND HEALTH

1. Nature and Extent of the Problem

Occupational illnesses and injuries are of human origin, and thus preventable. With approximately 100 million workers in this country, occupational hazards can pose a serious threat to health. Work conditions can yield daily exposure to such risks as: toxic chemicals, asbestos, coal dust, cotton fiber, ionizing radiation, physical hazards, excessive noise, as well as stress and routinized trivial tasks. A broad range of health problems may be associated with such exposures, including cancers, lung and heart diseases, birth defects, sensory deficits, injuries and psychological problems. Steps important to protecting the health of workers include not only education of workers about potential hazards, but engineering modifications to control hazards, regulatory efforts to promote worker safety, and additional research to identify the full range of occupational safety and health problems.

It must be recognized that there are limitations to the ability of regulatory agencies to contribute to the achievement of these objectives. The Occupational Safety and Health Administration and the Mine Safety and Health Administration are responsible for setting and enforcing standards to control work place hazards, but the enabling legislation for both of these agencies holds employers responsible for a healthful and safe work environment. Meeting these objectives will require a concerted National effort involving a commitment from not only regulatory agencies, but also employers and employee organizations.

a. Health implications

- Occupational illness
  - — occupational exposure to toxic chemicals and physical hazards such as dust from asbestos, silica, grain and cotton; fumes from chemicals; noise; ionizing radiation; sunlight and vibration—can all produce various problems such as lung disease, cancers, sensory loss, skin disorders, degenerative diseases in a number of vital organ systems, birth defects or genetic changes; these toxic effects may be acute or chronic;
  - — occupational exposures to some agents can also increase the frequency of stillbirths, spontaneous abortions, reduced fertility and sterility;
  - — in addition to the burden of permanent and partial disability brought on by job-related diseases, the National Institute for Occupational Safety and Health (NIOSH) estimates that each year 100,000 Americans die from occupational illnesses; nearly 400,000 new cases of occupational diseases are recognized annually; although these estimates made by NIOSH for the May 1972 President's Report on Occupational Safety and Health are controversial, no better estimates are available from the presently inadequate reporting of occupational disease;
  - — skin diseases are the largest group of occupational illness (43 percent in 1976), followed by repeated trauma (14 percent);
  - — about 15 percent of coal miners exhibit some chest x-ray evidence of coal workers' pneumoconiosis, and black lung disease may be responsible for 4,000 deaths each year;
  - — recent studies suggest that occupations associated with handling wood and wood products have increased risk of certain cancers;
  - — an estimated 1.6 million present and former asbestos workers have increased risk of death from asbestos-related diseases such as lung cancer, mesothelioma and asbestosis;
  - — the lung cancer rate among coke oven workers is about 10 times the National average;
  - — an estimated 2 million workers have been exposed to benzene and 2 to 3 million to vinyl chloride, chemicals thought to cause cancer;
  - — job-related stress, ergonomic issues, and poor job design also contribute to illness and injury (in both service and manufacturing sectors) to an undetermined degree.
  - — See Misuse of Alcohol and Drugs and Control of Stress and Violent Behavior.
- Occupational injury
  - — in 1978, work accidents resulted in 4,590 deaths;
  - — in 1977, more than 2.3 million workers experienced disabling injuries (80,000 of which were permanently disabling);
  - — the injuries span a wide spectrum including: electrical shocks, falls, crushes, motor vehicle accidents, burns and eye injuries;
  - — workers in mining, agriculture (including forestry and fishing) and construction are six, three and three times, respectively, more

likely to die from a work-related injury than other private sector workers;
- slips and falls are often due to lack of good housekeeping at the job site;
- poor architectural design such as incorrect placing of stairs, wrong height of stair lifts, improper lighting and ventilation, and improper engineering of equipment can contribute to or cause illness and injuries.

b. Status and trends

- Occupational illness
  - toxic effects have been reported for nearly 45,000 to 50,000 chemicals which are thought to appear in the workplace—over 2,000 of which are suspected human carcinogens in laboratory animals;
  - one survey has indicated that 9 out of 10 American industrial workers may not be adequately protected from exposure to at least 1 of the 163 most common hazardous industrial chemicals;
  - approximately 21 million American workers are exposed to substances regulated by the Occupational Safety and Health Administration.
- Occupational injury
  - direct and indirect costs of occupational accidents are estimated at $20.7 billion per year;
  - each year about one worker in nine in private industry experiences an occupational injury;
  - in 1978, there were, on average, 9.2 injuries and illnesses and 62.1 lost workdays per 100 full-time workers;
  - Worker's Compensation payments in 1976 ($7.5 billion) were up 14 percent from 1975 and were three times the level of 1966;
  - between 1976 and 1977, the number of work-related injuries increased from 5.0 million to 5.3 million, the number of workdays lost increased from 32.5 million to 35.2 million, the average days lost per injury decreased from 17 days to 16 days, and the number of fatalities increased for companies with 11 or more employees from 3,940 to 4,760; these data show aggregate trends, however, they do not reflect the relative severity of different injuries.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - reviewing, recommending, initiating and publicizing occupational health and safety standards, procedures, controls, and practices necessary for assessing, monitoring, controlling, and eliminating on-the-job health and safety hazards, including environmental health requirements;
  - initiating, as a management responsibility in concert with workers and their representatives, experimental and innovative educational programs regarding exposures to and control of occupational health and safety hazards;
  - initiating and expanding methods designed to motivate labor and management responsibility for the development and maintenance of a safe and healthful work and community environment;
  - developing awareness of the potential interactions between occupational health hazards and lifestyle habits and behavior and their effects on health;
  - developing worker awareness through labeling, electronic and print media, vocational training programs, health care providers, campaigns aimed at high-risk worker groups (e.g., asbestos workers, newly employed and elderly workers) and organized labor programs;
  - developing professional occupational health and safety personnel including occupational health physicians and nurses, industrial hygienists, toxicologists and epidemiologists and including occupational health education in the curricula of medical and nursing schools and continuing education;
  - developing awareness in other groups that either interact with workers or the workplace, including engineers, managers, teachers, social workers and health care workers;
  - developing public awareness of occupational disease and injuries and their high cost to the Nation;
  - labeling in simple language to inform workers, employers, health professionals and the public of the hazards, the associated risks and symptoms as appropriate;
  - including occupational health as part of the comprehensive health education curricula in high schools and vocational schools.
- Service measures include:
  - well-designed corporate occupational health programs that include preventive and treatment services directed at nonoccupational as well as occupational health;
  - consultation services of Governmental agencies to assist businesses to identify problems and to establish suitable programs to eliminate or control them;
  - encouraging small businesses to form cooperative groups to seek occupational health expertise;
  - developing a personal health service delivery system in which the diagnosis and treatment of occupational illnesses and injuries will be coordinated and integrated with all other

  - health services provided the worker and his family;
  - upgrading capabilities of State and local health departments to participate in occupational health and safety services, including monitoring, surveillance and consultation to small businesses.
- Technologic measures include:
  - improved architectural and engineering design of worksite to prevent injuries;
  - control technology to protect workers, including development of safe substitutes for toxic substances, design of process units that eliminate worker exposure, design of safe maintenance procedures and design of jobs to eliminate harmful physical and mental stress;
  - measurement technology to enable quick, accurate and economical assessment of hazard levels in the workplace by workers, employers or health professionals.
- Legislative and regulatory measures include:
  - fully implementing the OSHA/MSHA and other laws related to workers' health as well as the product control provisions of the Toxic Substances Control Act and the Consumer Product Safety Act;
  - recommending, initiating and evaluating measures designed to improve and expand occupational health and safety legislation, paying particular attention to possibilities of standardizing benefits through a national system of worker's compensation;
  - developing criteria documents recommending standards (NIOSH);
  - promulgating new health standards on hazardous substances (OSHA);
  - annual inspections by industrial hygienist compliance officers;
  - conducting mandated industrywide studies and Health Hazard Evaluations for carcinogenicity, reproductive effects, and other hazards that could lead to Emergency Temporary Standards;
  - changing Worker's Compensation Laws to provide stronger economic pressures on employers to reduce hazardous conditions at the worksite.
- Economic measures include:
  - fines and negative publicity for poorly controlled health and safety conditions;
  - tax deductions and other economic incentives for capital investment in control technology or occupational health programs.

b. Relative strength of the measures

- Given the broad nature and scope of occupational safety and health problems, the relative strength of the measures varies with the problem at hand, with the nature and adequacy of enforcement effort and social and political support and with research capacity. Most occupational health problems require the simultaneous or consecutive application of several types of measures as a total strategy to comprehensive hazard eradication. For example, eradication of the asbestos hazard might be achieved by:
  - banning all nonessential uses of asbestos;
  - substitution of other effective materials found to be nonhazardous;
  - research to determine physiologic effects of human exposure to the asbestos fiber;
  - worker information to minimize exposure that may still occur during demolition and repair work;
  - rigid enforcement of asbestos standards while use remains necessary;
  - professional education for physicians to assure proper medical help for exposed individuals.
- This type of eradication program focuses public attention on the problem and goes beyond establishing a standard for permissible exposure levels.

3. Specific Objectives for 1990 or Earlier

- Improved health status

a. By 1990, workplace accident deaths for firms or employers with 11 or more employees should be reduced to less than 3,750 per year. (In 1978, there were 4,170 work-related fatalities for firms or employers with 11 or more employees.)

b. By 1990, the rate of work-related disabling injuries should be reduced to 8.3 cases per 100 full time workers. (In 1978, there were approximately 9.2 cases per 100 workers.)

c. By 1990, lost workdays due to injuries should be reduced to 55 per 100 workers annually. (In 1978, approximately 62.1 days per 100 workers were lost.)

d. By 1990, the incidence of compensable occupational dermatitis should be reduced to about 60,000 cases. (In 1976, there were approximately 70,000 cases involving compensation.)

e. By 1990, among workers newly exposed after 1985, there should be virtually no new cases of four preventable occupational diseases—asbestosis, byssinosis, silicosis and coal worker's pneumoconiosis. (In 1979, there were an estimater 5,000 cases of asbestosis; in 1977, an estimated 84,000 cases of byssinosis were expected in active workers; in 1979, an estimated 60,000 cases of silicosis were expected among active workers in mining, foundries, stone, clay and glass products and abrasive blasting; in 1974, there were an estimated 19,400 cases of coal workers pneumoconiosis.)

f. By 1990, the prevalence of occupational noise-induced hearing loss should be reduced to

415,000 cases. (In 1975, there were an estimated 462,000 cases of work-related hearing loss.)

g. By 1990, occupational heavy metal poisoning (lead, arsenic, zinc) should be virtually eliminated. (Baseline data unavailable.)

- Reduced risk factors

h. By 1985, 50 percent of all firms with more than 500 employees should have an approved plan of hazard control for all new processes, new equipment and new installations. (Baseline data unavailable.)

i. By 1990, all firms with more than 500 employees should have an approved plan of hazard control for all new processes, new equipment and new installations. (Baseline data unavailable.)

- Improved public/professional awareness

j. By 1990, at least 25 percent of workers should be able, prior to employment, to state the nature of their occupational health and safety risks and their potential consequences, as well as be informed of changes in these risks while employed. (In 1979, an estimated 5 percent of workers were fully informed.)

k. By 1985, workers should be routinely informed of lifestyle behaviors and health factors that interact with factors in the work environment to increase risks of occupational illness and injuries. (Baseline data unavailable.)

l. By 1985, all workers should receive routine notification in a timely manner of all health examinations or personal exposure measurements taken on work environments directly related to them. (Baseline data unavailable.)

m. By 1990, all managers of industrial firms should be fully informed about the importance of and methods for controlling human exposure to the important toxic agents in their work environments. (Baseline data unavailable.)

n. By 1990, at least 70 percent of primary health care providers should routinely elicit occupational health exposures as part of patient history, and should know how to interpret the information to patients in an understandable manner. (Baseline data unavailable.)

o. By 1990, at least 70 percent of all graduate engineers should be skilled in the design of plants and processes that incorporate occupational safety and health control technologies. (Baseline data unavailable.)

- Improved services/protection

p. By 1990, generic standards and other forms of technology transfer should be established, where possible, for standardized employer attention to such major common problems as: chronic lung hazards, neurological hazards, carcinogenic hazards, mutagenic hazards, teratogenic hazards and medical monitoring requirements.

q. By 1990, the number of health hazard evaluations being performed annually should increase tenfold; the number of industrywide studies being performed annually should increase threefold. (In 1979, NIOSH performed approximately 150 health hazard evaluations; 50 industrywide studies were performed.)

- Improved surveillance/evaluation

r. By 1985, an ongoing occupational health hazard/illness/injury coding system, survey and surveillance capability should be developed, including identification of workplace hazards and related health effects, including cancer, coronary heart disease and reproductive effects. This system should include adequate measurements of the severity of work-related disabling injuries.

s. By 1985, at least one question about lifetime work history and known exposures to hazardous substances should be added to all appropriate existing health data reporting systems, e.g., cancer registries, hospital discharge abstracts and death certificates.

t. By 1985, a program should be developed to: 1) follow up individual findings from health hazard and health evaluations, reports from unions and management and other existing surveillance sources of clinical and epidemiological data; and 2) use the findings to determine the etiology, natural history and mechanisms of suspected occupational disease and injury.

4. Principal Assumptions

- Control technology will have been developed in the public and private sectors to reduce many major workplace hazards.
- A regulation program will have been developed for pre-evaluation and approval of hazard control plans for all new processes, new equipment and new installations.
- Greater use will be made of relevant State and local Government agencies, as well as those academic units which can address occupational safety and health problems.
- Comprehensive school health education curricula will incorporate concepts of occupational illness and injury including the role of lifestyle and personal habits (such as smoking and alcohol consumption) and the level of hazard for the individual with occupational exposures (e.g., asbestos and smoking, vinyl chloride and excessive drinking).
- Growing awareness of the importance of preventing occupational disease and injuries will facilitate legislative incentive to support the recommendations.
- Coordinated State and local implementation systems for recognition and prevention of occupational health and safety hazards will have been developed.
- Quality control in the delivery of occupational health and safety services will be improved.
- Workers in the public sector will be extended the same protection as those in the private sector.

5. Data Sources

a. To National level only

- National Occupational Hazard Survey. Inventory of work hazards. DHHS-Center for Disease Control (CDC), National Institute for Occupational Safety and Health (NIOSH). CDC *National Occupational Hazard Survey Reports,* Vol. 1–4, 1974–1979. Survey to be updated 1980–1982. Data obtained from on-site inspections of 800 industrial facilities 1972–79.
- Health hazard evaluation and industrywide studies. Morbidity, mortality and environmental studies. DHHS-CDC, NIOSH. Selected NIOSH Technical Reports. Continuous reporting.
- Occupational injury and illness. Job related injury and illness rates. Bureau of Labor Statistics. Annual reports, *Chartbook of Occupational Injuries and Illnesses* (summary tables). Continuous reporting; National sample.
- Surveillance, Epidemiology and End Result Program (SEER). Cancer incidence, morbidity and survival. DHHS-National Institutes of Health, National Cancer Institute. Periodic reports. Continuous reporting from State and regional cancer registries.
- Mine injuries. Injuries per hours worked. Department of Labor-Mine Safety and Health Administration. Quarterly reports. *Mine Injuries and Work Time.* Continuous reporting from workplace.

b. To State and/or local level

- State Worker's Compensation Systems. Occupational illness and injuries. Data collected by official State agencies. Sometimes analyzed in form to permit incidence estimates.

ACCIDENT PREVENTION AND INJURY CONTROL

1. Nature and Extent of the Problem

The principal causes of disability and death from injury are those associated with motor vehicles, falls, drownings, burns, poisoning and gunshot wounds. Most such deaths and injuries occur while driving, in the home or at work; many are also associated with recreation and sports. See Pregnancy and Infant Health, Toxic Agent Control, Occupational Safety and Health, Smoking and Health, Misuse of Alcohol and Drugs.

a. Health implications

- Unintentional injuries are the leading cause of death for people between 1 and 38 years of age, and a leading cause of disability.
- Minorities have higher accidental death rates than the overall population. For example, in 1973–75 the American Indian accidental death rate was 3.1 times the U.S. death rate for all races.
- According to the National Health Survey, 30 percent of the population is injured each year.
- 10,700 children under 15 years of age died from accidental injuries in 1978:
  - — for children between 5 and 15, motor vehicle fatalities accounted for 52 percent of all accidental deaths;
  - — the overall death rates from accidents for children under 15 fell from 26.6 per 100,000 in 1968 to 21.1 per 100,000 in 1978, a decrease of 20.7 percent.
  - — the most common fatal accidents to children at home were from fires (36 percent) and suffocation (25 percent).

b. Status and Trends

- Motor vehicle accidents account for the largest number of trauma deaths and injuries:
  - — there were approximately 52,400 deaths from motor vehicle accidents in 1978, a rate of 24.0 per 100,000 population, which represents an increase from the low of 21.5 deaths per 100,000 in 1975;
  - — of these motor vehicle accident deaths, over 9,000 were pedestrians, a 2 percent increase from 1977;
  - — there were approximately 2 million disabling injuries from motor vehicle accidents in 1978;
  - — the motor vehicle fatality rate for children under 15 decreased from 10.4 per 100,000 children in 1968 to 9.1 per 100,000 in 1978, a decrease of 12.5 percent;
  - — for 15 to 24 years olds, the motor vehicle fatality rate has climbed from 39.2 per 100,000 in 1975 to 46.1 in 1978;
  - — at least 45 percent of all fatal motor vehicle accidents are alcohol related; in single vehicle accidents, 65 percent of drivers are legally drunk (i.e., with blood alcohol concentration of over .10 percent).
- Falls
  - — there were 13,690 deaths from falls in 1978 and over 11 million injuries;
  - — the mortality rate from falls was 6.3 per 100,000 in 1978, and has been declining in recent years;
  - — over fifty percent of fatal falls occur in the home;
  - — fifty-seven percent of fatal falls involve persons 75 or older;
  - — older people who survive falls are more apt to experience fractures than are younger people;
  - — impairment by alcohol is a major contributor to falls.
- Drownings
  - — in 1978, there were 6,900 deaths from drownings, a number which has remained fairly constant over the past 15 years despite increasing participation in water-related activities;
  - — approximately 1 in 6 drownings (over 1,000) involve boating mishaps;
  - — a substantial proportion of drownings occur in unattended bodies of water.
- Burns
  - — there were 6,300 deaths from fires and burn injuries in 1978, a rate of 2.9 per 100,000 persons;
  - — there are an estimated 60,000 hospital admissions for burn injuries per year, with the average length of hospital stay being 15 days;
  - — age specific rates for burn deaths are high in children and the elderly;
  - — most fire deaths are caused by residential fires; about one-third of fatal house fires,

and a substantial number of burn injuries, are related to cigarette smoking;
- the largest number of burn injuries requiring hospitalization are caused by scalds;
- both alcohol and smoking are significant factors in fire-related deaths.

- Gunshot wounds
  - are second only to motor vehicle crashes in causing death from traumatic injury;
  - in 1977, there were 31,000 deaths from gunshot wounds;
  - approximately 2,000 of these were accidental; 12,900 were homicides; 16,000 were suicides;
  - in 1978, the death rate for non-whites from gunshot wounds (including accidents, suicides and homicides) was 21.3 per 100,000 population; compared to a rate of 3.6 per 100,000 for whites; for black males 15 to 24, gunshot wounds were the leading cause of death;
  - firearm deaths are strongly associated with alcohol misuse.
- Poisonings
  - an estimated 400,000 children under age 5 are accidentally poisoned each year, one-fourth of whom will be retreated for poisoning.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - integrating safety education into the kindergarten through 12th grade school curriculum, with special attention to highway safety (and misuse of alcohol), poisoning, water safety and burns;
  - educating parents and health professionals about the importance of crash-tested child restraints and seat belts and their proper use in motor vehicles;
  - educating parents and child caretakers about general safety for children, including preschool traffic safety;
  - water safety and swimming education programs;
  - educating the elderly in measures to reduce risks of falls;
  - educating architects, building contractors and related professionals, including health professionals, on fire safety;
  - safety education and first-aid training for health professionals and the public;
  - educating the public on safe handling of firearms as part of general accident prevention programs;
  - educating the general public, legislators and other decisionmakers on the extent of the firearm injury problem;
  - self-protection training programs for shopkeepers, taxi drivers and others working in jobs at high risk of armed robbery.
  - See Misuse of Alcohol and Drugs.
- Technologic measures include:
  - improved automobile crashworthiness;
  - improved highway design facilitating prevention of automobile crashes;
  - increased use of impact attenuators on highways;
  - bikepath development;
  - improved design criteria for homes to prevent injury from falls;
  - improved design of swimming pools and environs;
  - increased use of flame retardant materials for clothes and furnishings;
  - introduction of self-extinguishing matches and cigarettes into general use;
  - improvement of trigger safety lock designs;
  - use of non-lethal (wax) bullets for target guns;
  - improved safety design of toys, gymnasium equipment, other play equipment for schools and playgrounds;
  - continued safety packaging of medications to prevent poisoning;
  - efficient emergency medical services.
- Legislative and regulatory measures include:
  - mandatory automatic restraint systems in cars;
  - mandatory infant and child carrier use in cars;
  - standards for crashworthiness and crash avoidance;
  - motorcycle helmet laws;
  - improved enforcement of laws related to speeding, driving while under the influence, and seat belt use;
  - strengthened building and housing codes;
  - floor-covering standards to protect against falls;
  - standards for personal flotation devices;
  - safety standards for public swimming pools;
  - mandatory use of smoke detectors;
  - mandatory non-scald settings for hot water heaters;
  - uniform laws regarding the purchase and possession of handguns.
- Economic measures include:
  - reduced insurance premium rates for drivers who do not drink or are otherwise at very low risk;
  - reduced rates on home insurance for special protective measuers against falls or fires;
  - reduced insurance rates for recreational fa-

cilities, such as children's camps and parks, which have implemented effective safety measures.

b. Relative strength of the measures

- Safety education is a time-honored and widely used prevention measure in injury control. The National Safety Council, the American Red Cross, and a large number of accident prevention projects at all levels of Government depend on education as the mainstay of their programs. Although there is widespread support for all kinds of educational efforts in this field, evaluation of educational programs that use rates of morbidity and mortality as outcome measures have not demonstrated significant effects in reducing injury rates. However, a majority of safety professionals express strong confidence in training and education as a powerful tool for building skills, increasing awareness and creating a climate for change.
- Technologic strategies have accounted for significant reductions in morbidity and mortality from injury and poisoning. Motor vehicle design changes to improve occupant protection have been demonstrated to reduce the probability of death or serious injury in the event of a collision. Industry has achieved remarkable reductions in injury rates through improvements in machinery design. Childproof containers for medications have dramatically reduced accidental poisoning. The effectiveness of technologic depends on both the relationship of the design to injury causation and the rate of adoption of the change.
- Regulatory measures such as building codes, fire codes and safety standards for materials and machinery are widely accepted as effective countermeasures. Regulatory measures have variable effectiveness depending on compliance rates, enforcement and the relationship of the measure itself to injury causation.
- The effectiveness of economic incentives for the prevention of injury is only beginning to be explored outside the industrial setting. It has been suggested that low insurance rates for drivers who have not been involved in crashes or who have no violations on their record may provide incentives for more careful driving, but the strategy has not been evaluated. Product liability suits have created incentives for manufacturers to design and market safer products and to recall defective ones. Adjustment of insurance premiums for summer camps has been used to provide incentives for hazard removal and has been associated with reductions in injury rates.

3. Specific Objectives for 1990

- Improved health status

a. By 1990, the motor vehicle fatality rate should be reduced to no greater than 18 per 100,000 population. (In 1978, it was 24.0 per 100,000 population.)

b. By 1990, the motor vehicle fatality rate for children under 15 should be reduced to no greater than 5.5 per 100,000 children. (In 1978, it was 9.2 per 100,000 children under 15.)

c. By 1990, the home accident fatality rate for children under 15 should be no greater than 5.0 per 100,000 children. (In 1978, it was 6.1 per 100,000 children under 15).

d. By 1990, the mortality rate from falls should be reduced to no more than 2 per 100,000 persons. (In 1978, it was 6.3 per 100,000.)

e. By 1990, the mortality rate for drowning should be reduced to no more than 3.0 per 100,000 persons. (In 1978, it was 3.2 per 100,000.)

f. By 1990, the number of tap water scald injuries requiring hospital care should be reduced to no more than 2,000 per year. (In 1978, it was 4,000 per year.)

g. By 1990, residential fire deaths should be reduced to no more than 4,500 per year. (In 1978, it was 5,400 per year.)

h. By 1990, the number of accidental fatalities from firearms should be held to no more than 1,700. (In 1978, there were 1,800.)

— See Misuse of Alcohol and Drugs.

- Reduced risk factors

i. By 1990, the proportion of automobiles containing automatic restraint protection should be greater than 75 percent. (In 1979, the proportion was 1 percent.)

j. By 1990, all birthing centers, physicians and hospitals should ensure that at least 50 percent of newborns return home in a certified child passenger carrier. (Baseline data unavailable).

k. By 1990, at least 110 million functional smoke alarm systems should be installed in residential units. (In 1979, there were approximately 30 million systems.)

- Increased public/professional awareness

l. By 1990, the proportion of parents of children under age 10 who can identify appropriate measures to address the three major risks for serious injury to their children (i.e., motor vehicle accidents, burns, poisonings) should be greater than 80 percent. (Baseline data unavailable.)

m. By 1990, virtually all primary health care providers should advise patients about the importance of safety belts and should include instruction about use of child restraints to prevent injuries from motor vehicle accidents as part of their routine interaction with parents. (In 1979, the proportion of pediatricians who reported that they advised parents on car safety measures was approximately 20 percent.)

- Improved services/protection

n. By 1990, at least 75 percent of communities with a population of over 10,000 should have the capability for ambulance response and transport within 20 minutes of a call. (In 1979, approximately 20 percent had this capability.)

o. By 1990, virtually all injured persons in need should have access to regionalized systems of trauma centers, burn centers and spinal cord injury centers. (In 1979, about 25 percent of the population lived in areas served by regionalized trauma centers.)

p. By 1990, at least 90 percent of the population should be living in areas with access to regionalized or metropolitan area poison control centers that provide information on the clinical management of toxic substance exposures in the home or work environment. (In 1979, about 30 percent of the population lived in such areas.)

- Improved surveillance/evaluation systems

q. By 1990, at least 75 percent of the states will have developed a detailed plan for the uniform reporting of injuries.

4. Principal Assumptions

- Children:
  - — improvements will occur in design and use of child restraint systems;
  - — increases will occur in use of automatic restraints;
  - — trends in product safety regulation for the protection of children will continue.
- Motor Vehicles:
  - — highway safety and vehicle safety will continue to be improved;
  - — use of safety belts and child restraints will in-increase to thirty-five percent;
  - — the 55 MPH speed limit will be vigorously enforced;
  - — more State laws will be passed to reduce alcohol-related crashes, and more stringent enforcement of existing laws will occur;
  - — See Misuse of Alcohol and Drugs.
- Falls:
  - — improved design will be effected in new and existing dwelling units (handrails, lighting);
  - — alcohol abuse prevention and treatment programs will be increasingly available.
- Drownings:
  - — swimming pool design will improve, including modifications to access;
  - — licensing/certification of boat operators will grow.
- Burns:
  - — there will be a continued decline in per capita cigarette consumption;
  - — improvements in building codes and their enforcement will occur;
  - — self-extinguishing matches and cigarettes will become available.
- Gunshot wounds:
  - — there will be an increase in State laws concerning purchase and possession of handguns;
  - — fewer people will purchase handguns;
  - — there will be improvements in design and increase in use of gun safety devices.

5. Data Sources

a. To National level only

- National Electronic Injury Surveillance System (NEISS). Traumatic consumer product related injuries. Consumer Product Safety Commission (CPSC). *NEISS Data Highlights* and *News from CPSC*, selected reports. Continuous daily injury reporting and detailed accident investigations of selected high priority cases, National sample of 74 hospital emergency rooms. Reporting initiated in 1972, revised in 1978.
- Occupational injury and illness. Job related injury and illness rates. Department of Labor, Bureau of Labor Statistics. Compiled from continuous monthly and selected reports, from *Chartbook on Occupational Injuries and Illnesses* tables.
- Fatal Accident Reporting System (FARS). Describes detail of fatal highway accidents. Department of Transportation (DOT), National Highway Traffic Safety Administration. *Fatal Accident Reporting System Annual Report.* Continuous reporting.
- Health Interview Survey (HIS). Sickness and injuries among members of households experienced during two weeks prior to the interview. DHHS-National Center for Health Statistics (NCHS). NCHS *Vital and Health Statistics*, Series 10. Continuous household interview survey; National sample.
- Boating accidents. Compilation of boating accident and registration statistics. DOT-U.S. Coast Guard. *Boating Statistics* (COMDTINST M16754.1, Old CG–357). Full count and selected activities reported annually from recreational boat numbering and casualty reporting systems.
- Surveillance and studies of accidents. Causes and prevention of vehicular accidents; other studies. *Accident Analysis and Prevention—An International Journal.* Pergamon Press, Ltd. Continuous quarterly reports.
- Surveillance and studies of accidents. Selected study reports, various topics. Metropolitan Life Insurance Company. *Statistical Bulletin.* Survey and full count data. Continuous quarterly publication.
- Hospital Discharge Survey (HDS). Trauma, burn patients discharged from short stay hospitals. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 13, selected reports. Continuous; National probability sample.

b. To State and/or local level

- National Vital Registration System
  - — Mortality. Deaths by cause (including accidents) by age, sex and race. DHHS-NCHS. NCHS *Vital Statistics of the United States*, Vol II, and NCHS *Monthly Vital Statistics Reports*. Continuing reporting from States; National, full count. (Many States issue earlier reports.)
- Accident reports. Numbers and rates of accidents by type. National Safety Council. *Accident Facts*, an annual report of surveys, full count data, and extrapolations of data, including selected summary reports; and *Journal of Safety Research*, selected accident study reports, published quarterly. Data from State, Federal, local governments and private industry and organzations.
- Motor vehicle accidents
  - — Reports from State Motor Vehicle departments.
  - — Epidemiologic survey data on traffic accidents and conditions. When, where and how traffic accidents occur. State traffic authorities and DOT-Federal Highway Administration. Selected reports and annual summaries.
- State burn registries, where established.
- Hospitalized illness discharge abstract systems.
  - — Professional Activities Study (PAS). Patients in short stay hospitals; patient characteristics, diagnoses of trauma and burns, procedures performed, length of stays. Commission on Professional and Hospital Activities, Ann Arbor, Michigan. Annual reports and tapes. Continuous reporting from 1900 CPHA member hospitals; not a probability sample, extent of hospital participation varies by State.
  - — Medicare Hospital Patient Reporting System (MEDPAR). Characteristics of Medicare patients, diagnoses, procedures. DHHS-Health Care Financing Administration, Office of Research, Demonstration and Statistics (ORDS). Periodic reports. Continuing reporting from hospital claim data; 20 percent sample.
  - — Other hospital discharge systems as locally available.
- Selected health data. DHHS-NCHS. NCHS *Statistical Notes for Health Planners*. Compilations and analysis of data to State level.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and county level from various sources. DHHS-Health Resources Administration. *Area Resource File: A Manpower Planning and Research Tool*. DHHS-HRA-80-4, Oct 79. One time compilation.

FLUORIDATION AND DENTAL HEALTH

1. Nature and Extent of the Problem

Dental diseases probably constitute, in the aggregate, the most prevalent health problem in the Nation. The two most prevalent oral diseases are dental caries (tooth decay) and periodontal disease (diseases of the gums and other tissues supporting the teeth). If not controlled, each of these diseases progresses to an advanced stage that is difficult and, therefore, expensive to treat. If left untreated, or if treatment is delayed too long, dental caries and periodontal disease result in tooth loss. However, based on current knowledge, both of these diseases can be prevented in most persons. Fluoridation—particularly of community water supplies—is the most effective measure to reduce the incidence of the largest problem, dental caries, with the capability of preventing 65 percent of dental caries and 50 percent of children's dental bills. Fluoridation is, therefore, the major focus of this section, but other measures important to dental health are also discussed.

a. Health implications

- Dental caries is localized, progressive destruction of the tooth initiated by acid demineralization of the outer tooth surface. Caries results from a complex interaction among three factors: tooth susceptibility, bacteria in plaque and dietary environment.
- Periodontal disease is an insidious inflammatory disease which affects the gums and the alveolar bone supporting the teeth. There are several type of periodontal disease. The initial and most common type is gingivitis or inflammation of the gums. If untreated, this condition usually develops into periodontitis, the chronic destructive stage of the disease. In the advanced stages, the bone supporting the teeth is destroyed, the teeth loosen and eventually are lost.
- Research findings indicate that certain oral bacteria—associated with plaque and calculus accumulations on teeth—are the prime cause of periodontal disease. Several other factors that may be associated with the development of the disease include: poor nutrition, malocclusion, grinding of the teeth, the loss of teeth which causes those remaining to drift out of position and hormonal imbalances.

b. Status and trends

- Dental caries affects 98 percent of the U.S. population, creating a dental disease problem of massive proportions.
- By 17 years of age, 94 percent of children have experienced caries in their permanent teeth. On average, 17 year-olds have had about nine permanent teeth affected.
- Low income children have about four times more untreated decayed teeth than high income children.
- Forty-seven percent of children under age 12 have never been to a dentist.
- About 31 million adults aged 18 to 74 years have lost all of their upper or lower natural teeth. This includes about 19 million adults who have lost all their teeth.
- Periodontal disease is the second most prevalent oral disease. More than 65 million persons have periodontal disease, including nearly 12 million children and more than 53 million adults.
- The proportion of persons with periodontal disease increases significantly with age:
  - — almost one-third of children aged 12 to 17 years have gingivitis;
  - — among those persons 65 to 74 years of age with some natural teeth still present, two-thirds have periodontal disease, half of whom have the disease in its destructive stage.
- Data from the initial and 1971–74 National Center for Health Statistics (NCHS) health examination survey suggest periodontal disease is decreasing in prevalence.
- Injuries to the teeth and mouth also constitute a sizeable dental problem.

2. Prevention/Promotion Measures

Dental disease prevention covers a spectrum of many activities—the fluoridation of community and school water supplies, dental health education, fluoride supplements and rinses, individual improvement of oral hygiene and dietary practices and routine professional check-ups. Included in this spectrum are procedures to modify the behavior patterns of individuals regarding measures such as diet change, tooth brushing and flossing.

a. Potential measures

Measures to prevent dental caries may be directed at one of the three principal contributing factors:

tooth susceptibility, bacteria in plaque and dietary environment. Reduction of bacterial agents is accomplished through a proper personal oral hygiene regimen and regular prophylaxes given by a dental professional. For a proper dietary environment, highly cariogenic foods and snacks, particularly those containing refined sugars, should be avoided; however, if such foods are consumed, the teeth ought to be thoroughly brushed immediately afterwards. The caries susceptibility of teeth is significantly reduced through the proper use of fluorides. For persons not ingesting sufficient fluoride as it occurs naturally in their drinking water, fluoride measures are needed. The ingestion of fluorides from birth is most effective and may be accomplished through either fluoridation of drinking water supplies or the use of dietary fluoride supplementary. Fluoridation of water supplies is the most practical measure. As a less effective alternative, topical fluorides may be applied either by the individual or a dental professional. The benefits and safety of fluorides in preventing dental caries are well documented as the result of almost five decades of research and over 30 years of experience. Although the technology of fluoridation as an effective prevention measure for dental caries is well established, a considerable gap persists between knowledge and application. To implement near universal fluoridation in the United States requires an array of interacting strategies.

The prevention of periodontal disease requires proper oral hygiene to minimize plaque deposits on the teeth. Calculus, a hard crust-like material formed at and below the gum margin by deposition of calcium and phosphate from saliva in neglected plaque, must also be removed. As periodontal pockets are formed, bacteria and food particles may lodge in the pockets resulting in more inflammation and setting up a cycle in the disease process. Plaque can be removed by the individual by thorough brushing and flossing of the teeth on a daily basis. Calculus, however, cannot be removed by simple brushing, but requires scaling of the teeth regularly by a dentist or dental hygienist.

- Education and information measures include:
  - — public educational efforts to promote fluoridation of community and school water systems as well as other caries and periodontal disease preventive measures at National, State and local levels—using electronic and print media, school health curricula, health organizations and lay groups;
  - — informing and involving key groups and individuals, including health professionals, community decisionmakers, health organizations, waterworks associations, and lay groups and organizations in the prevention of dental disease;
  - — using schools to promote both fluoridation and improved preventive periodontal measures;
  - — developing local advocacy groups to encourage the adoption and retention of fluoridation through the appropriate political process.
- Service measures include:
  - — fluoridation of water systems*:
    - – community water fluoridation: most community water supplies contain less than optimum concentrations of naturally-occurring fluoride and need to be fluoridated; among communities of 1,000 or more population, about 8,670 water systems serving about 5,860 communities have not yet been fluoridated; approximately 32 percent of the U.S. population (67 million persons) were served by these fluoride-deficient water systems in 1975; another 17 percent were not served by community water systems at all; thus, approximately 51 percent of the population was served by public water systems providing an adjusted optimal fluoride level and an additional 8 percent of the population used naturally fluoridated drinking water at optimum or higher fluoride level.
    - – school water fluoridation: elementary and secondary schools on independent water systems (i.e., schools not served by community water systems) that are located in fluoride-deficient areas need to be fluoridated; school water fluoridation can reduce the incidence of dental decay by up to 40 percent, and could serve an additional 2.2 million school children.

    ***NOTE:** Optimum fluoride concentration: For community water fluoridation, the recommended optimum fluoride concentration is determined by the mean maximum daily temperature over a five-year period—in the United States, the optimum fluoride concentration for community water fluoridation ranges between 0.7 and 1.2 parts of fluoride per one million parts of water (ppm); for separate school water fluoridation, the recommended fluoride concentration is 4.5 times the optimum fluoride concentration recommended for community water fluoridation in the same geographic area.
  - — school-based caries and periodontal disease preventive services; a full range of appropriate preventive services can be made readily available to children enrolled in elementary and secondary schools and to younger children in day-care centers, Head Start programs and preprimary programs, including as appropriate:
    - – self-applied fluoride measures through

    dietary fluoride supplements, usually taken in tablet form, or fluoride mouthrinses;
    - educational and informational measures as a component of general health education;
    - school and community activities to limit the accessibility of highly cariogenic foods and snacks to children;
    - school-based educational and hygienic periodontal disease preventive services.

- Technology measures include:
  - efforts to ensure that the fluoride concentrations of water distributed from fluoridated water systems are maintained at optimum levels at all times (unless the fluoride concentration is maintained at the optimum level, the reduction of dental caries is markedly decreased):
    - continuous operation of fluoridation equipment;
    - proper and timely monitoring and surveillance of fluoridated water systems;
    - training and continuing education for waterworks personnel and engineers and for school personnel responsible for operation of school fluoridation equipment;
    - use of modern technology in fluoridation system surveillance;
    - improved technology for fluoridation equipment, and testing and engineering procedures;
    - ensuring an adequate supply of needed types of fluoride compounds.
- Legislative and regulatory measures include:
  - developing model State laws and regulations for fluoridation and fluoridation monitoring and surveillance systems;
  - clarifying specific provisions of Federal and State safe drinking water laws and regulations which potentially delay the implementation of fluoridation.
- Economic measures include:
  - financial and technical assistance to support expansion of community and school water fluoridation;
  - inclusion of fluoridation equipment, where appropriate, in the funding of new or improvide water systems by the U.S. Department of Housing and Urban Development, the Economic Development Administration and the Farmers Home Administration;
  - reducing premiums for dental insurance for families with children who live in fluoridated communities;
  - reducing HMO capitation charges for dental coverage for families with children who live in fluoridated communities.

b. Relative strength of the measures

- Measures which in combination ensure that children receive the full benefits of fluoride, infrequently consume highly cariogenic foods and follow a proper personal oral hygiene regimen have a synergistic effect on preventing dental caries and reducing the need for and cost of children's dental care. These measures do not alter the need for regular visits to the dentist and the prompt treatment of caries that does develop.
- Fluoridation of community water supplies is estimated to yield $50 in savings from reduced treatment for each dollar invested.
- The fluoridation of community water systems is the most effective, least costly public health measure for preventing dental caries. Benefits that accrue in children include:
  - teeth that are more resistant to caries;
  - as much as two-thirds less caries in children who drink fluoridated water from birth;
  - as many as six times more caries-free teenagers in fluoridated communities as in nonfluoridated communities;
  - fewer extractions of primary and permanent teeth;
  - fewer and less complex and, therefore, less costly restorative services (children's dental treatment costs in fluoridated communities can be one-half the costs in nonfluoridated communities).
- Adults consuming fluoridated water throughout life can expect fewer caries-related treatment needs and less loss of teeth due to caries.
- Substantial, though in most instances less beneficial, results can be realized from other fluoride measures (the percentage reductions of these measures are not arithmetically additive):
  - dietary fluoride supplements in recommended dosages:
    - if provided in school programs, result in caries reductions in permanent teeth ranging from 25 to 35 percent after two or more years of fluoride ingestion.
  - a weekly fluoride rinse regimen, utilizing a 0.2 percent neutral sodium fluoride solution, can reduce caries incidence by about 25 percent;
  - a fluoride dentrifrice (toothpaste) can reduce caries incidence by 20 percent;
  - professionally-applied fluorides can reduce caries incidence by about 35 percent.
- Regular oral examinations serve to identify caries at an early stage so that treatment can be prompt, and unnecessary further destruction and potential loss of the teeth prevented.
- Both fluoridation and school-based programs ensure that children of all socioeconomic levels receive caries preventive services.

- Since the United States began using community fluoridation in 1945, there have always been barriers to attaining goals of near universal fluoridation, including community inaction, financial limitations on communities, improper systems surveillance, and the powerful antifluoridationist lobby. Also, some fluoridated systems are maintained below the recommended optimum level.
- Vigorous promotional efforts to prevent periodontal disease can also be effective. Particularly important in this regard are efforts to encourage the public—especially school children—to practice good oral hygiene on a daily basis and to make regular visits to the dentist.

3. Specific Objectives for 1990 or Earlier

- Improved health status
  a. By 1990, the proportion of nine-year-old children who have experienced dental caries in their permanent teeth should be decreased to 60 percent. (In 1971–74, it was 71 percent.)
  b. By 1990, the prevalence of gingivitis in children 6 to 17 years should be decreased to 18 percent. (In 1971–74, the prevalence was about 23 percent.)
  c. By 1990, in adults the prevalence of gingivitis and destructive periodontal disease should be decreased to 20 percent and 21 percent, respectively. (In 1971–74, for adults aged 18 to 74 years, 25 percent had gingivitis and 23 percent had destructive periodontal disease.)
- Reduced risk factors
  d. By 1990, no public elementary or secondary school (and no medical facility), should offer highly cariogenic foods or snacks in vending machines or in school breakfast or lunch programs.
  e. By 1990, virtually all students in secondary schools and colleges who participate in organized contact sports should routinely wear proper mouth guards. (Baseline data unavailable.)
- Increased public/professional awareness
  f. By 1990, at least 95 percent of school children and their parents should be able to identify the principal risk factors related to dental diseases and be aware of the importance of fluoridation and other measures in controlling these diseases. (Baseline data unavailable.)
  g. By 1990, at least 75 percent of adults should be aware of the necessity for both thorough personal oral hygiene and regular professional care in the prevention and control of periodontal disease. (In 1972, only 52 percent knew of the need for personal oral hygiene and only 28 percent were aware of the need for dental checkups.)
- Improved services/protection
  h. By 1990, at least 95 percent of the population on community water systems should be receiving the benefits of optimally fluoridated water. (In 1975, it was 60 percent.)
  i. By 1990, at least 50 percent of school children living in fluoride-deficient areas that do not have community water systems should be served by an optimally fluoridated school water supply. (In 1977, it was about 6 perent.)
  j. By 1990, at least 65 percent of school children should be proficient in personal oral hygiene practices and should be receiving other needed preventive dental services in addition to fluoridation. (Baseline data unavailable.)
- Improved surveillance/evaluation systems
  k. By 1990, a comprehensive and integrated system should be in place for periodic determination of the oral health status, dental treatment needs and utilization of dental services (including reason for and costs of dental visits) of the U.S. population.
  l. By 1985, systems should be in place for determining coverage of all major dental public health preventive measures and activities to reduce consumption of highly cariogenic foods.

4. Principal Assumptions

- Even though community water fluoridation is the most effective public health measure for preventing dental caries, this measure alone cannot do the job. Significant progress will not be made in reducing the national dental caries rate in children and increasing the proportion of children who are caries free until such time as all three major approaches to caries prevention—proper personal oral hygiene, diet low in highly cariogenic foods and fluoride protection—are followed in combination, as needed, by the majority of children in this country.
- Support for fluoridation assistance programs will grow to a level to meet the program's major objective—near universal fluoridation.
- Organized dentistry's support for dental caries and periodontal disease prevention measures will increase at the National, State and local levels.
- State and local health and education agencies, the Health Systems Agencies, the State Health Planning and Development Agencies and the Statewide Health Coordinating Councils will increase their concern for and expand their activities to support fluoridation, school-based prevention oriented dental programs and periodontal health promotion.
- Fluoridation will continue to have the strong endorsement of virtually every major National health organization.
- The cost/benefit ratio of community water fluoridation will continue to be more favorable than for any other known public health measure implemented for the prevention of dental caries.
- The percent of the total U.S. population on community water supplies will not change appreciably between 1980 and 1990 (approximately 82 percent in 1979).

5. Data Sources

a. To National level only

- The Health and Nutrition Examination Survey (HANES). Prevalence of dental caries, periodontal disease, edentulousness and related information in U.S. population. DHHS-National Center for Health Statistics (NCHS). NCHS *Vital and Health Statistics,* Series 11, selected reports. Periodic survey, national sample. Note: dental data collected in HANES I (1971–74), not in HANES II (1976–80).
- State legislation on fluoridation. New or proposed State legislation affecting fluoridation of water supplies. DHHS-Center for Disease Control (CDC). CDC analysis compiled from Commerce Clearing House, Inc. information. Continuing.
- Effects of fluoridation on dental practice and dental human resource requirements. American Dental Association Bureau of Economic and Behavioral Research. Periodic reports. Continuing: national surveys of practicing dentists.

b. To State and/or local level

- Fluoridation census. Fluoridation status of community water supplies, adjusted and natural; population served, dates fluoridation initiated, other related information. DHHS-CDC. CDC 1975. To be conducted annually beginning in 1980. Data to be aggregated at National and State levels.
- National Dental Caries Prevalence Survey. Dental caries and periodontal disease among school children, grades K–12, related to fluoride content of drinking water for the school and place of residence of the children in the study. DHHS-National Institute of Dental Research. Report forthcoming. Survey, 1980. Additional surveys planned at 3 year intervals.
- Early and Periodic Screening, Diagnosis and Treatment (EPSDT) reporting system. Oral health status and referral of children screened. DHHS-Health Care Financing Administration (HDFA), Office of Research, Demonstration and Statistics. *Medicaid Statistics,* selected reports. Continuous reporting from State Medicaid offices.
- Selected health data. DHHS-NCHS. NCHS *Statistical Notes for Health Planners.* Compilations and analysis of NCHS data to State level.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and county level from various sources. DHHS-Health Resources Administration. *Area Resource File: A Manpower Planning and Research Tool,* DHHS–HRA–80–4, Oct 79. One time compilation

SURVEILLANCE AND CONTROL OF INFECTIOUS DISEASES

1. Nature and Extent of the Problem

Current surveillance and classification systems do not accurately reflect the importance of infectious diseases on the health and well-being of the nation. Only one category of infectious diseases (influenza and pneumonia) is ranked among the top 10 causes of death according to the National Center for Health Statistics (NCHS). However, were infectious diseases to be grouped in a manner similar to the cardiovascular diseases and cancer, 123,000 deaths would have been attributable to infectious diseases in 1976, surpassed only by cardiovascular diseases (719,000) cancers (387,000), and stroke (182,000). However, even this figure is an underestimate of the total impact. When it is adjusted for the probable sensitivity of the surveillance systems used, over 300,000 deaths may be attributable to infectious diseases each year. Particularly underestimated are the incidences of the common infectious diseases of the respiratory, gastro-intestinal and genitourinary tracts.

a. Health implications

- Over 2 million nosocomial infections (acquired in patient-care institutions) occur each year, and 60,000 to 80,000 persons die as a direct or indirect result of such infections. An estimated 20 percent of these infections are preventable with current control technologies.
- Each year, an estimated 2,400,000 cases of pneumonia occur, with pneumococcal pneumonia alone affecting 400,000 persons at a cost of $325 million.
- An anual average of 57,000 deaths attributable to pneumonia and influenza has been reported over the last 10 years.
- In 1977, there were 30,145 reported cases of tuberculosis and 2,968 associated deaths.
- Each year, an estimated 1,200,000 cases of salmonellosis occur, with an estimated direct cost of $774 million.
- Annually, an estimated 200,000 cases of shigellosis occur, with an estimated direct cost of $130 million.
- Almost three quarters of food-borne diseases originate in food service establishments. (65 percent) or food processing plants (4 percent).
- Each year an estimated 200,000 infections of hepatitis B virus occur, a third of which result in jaundice. Approximately 200 people die due to acute infection, 280 from liver cancer and 3,500 from cirrhosis caused by hepatitis B virus. The cost of acute disease is estimated to be $70 million.
- An estimated 60,000 acute cases of hepatitis A and 60,000 cases of non A/non B hepatitis occur each year costing approximately $120 million.
- Each year, an estimated 18,000 cases of bacterial meningitis are reported, with 2,500 associated deaths and an estimated direct cost of $58 million.
- In 1975, an epidemic year, an estimated 544,000 infections of St. Louis Encephalitis occurred in the United States.
- A 1977 epidemic of dengue in Puerto Rico resulted in an estimated 1,740,000 cases. Dengue outbreaks continue in the Caribbean area and in Mexico increasing the potential for the introduction of dengue into the continental United States.
- Infectious diseases including malaria, hepatitis and diarrheal diseases of viral, bacterial or parasitic origin, remain serious health hazards of international travel.

b. Status and trends

- There are between 190 and 250 million acute respiratory illnesses per year in the United States, resulting in a minimum of 400 million days in bed, 125 million days lost from work and 125 million days lost from school.
- Acute gastroenteritis is the second most common illness, accounting in one survey for 9.5 percent of all visits to pediatricians' offices.
- Infectious diseases result in approximately 27 million patient days of acute hospital care each year (10 percent of the patient days in acute care hospitals) at an estimated direct cost of nearly $6 billion.
- Infectious diseases, such as tuberculosis, continue to be more prevalent in poverty areas and areas with high immigration rates.
- Antibiotics and antimicrobials, the most commonly prescribed category of medication, account for a major portion of prescription drug costs.
- R plasmine mediated multiple-resistant organisms, which appear to be increasing among pathogens of man, threaten to blunt the effectiveness of previous therapeutic regimens.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - — better understanding and practice of basic hygienic measures, such as handwashing and proper handling of food;
  - — creation of an atmosphere conducive to greater public participation in health practice (e.g., more local demand for hygienic practices in food service establishments and for immunization availability);
  - — school health, and public and professional education to improve individual awareness of, and responsibility for, disease prevention practices such as handwashing, and obtaining immunization for one's self and one's children;
  - — educational approaches that take into account socioeconomic and ethnic differences that may influence both spread of disease and receptivity to change.
- Service measures include:
  - — operation of surveillance networks including definitive and dependable laboratory information to ensure early detection of infectious diseases and their causes;
  - — assistance in analysis of surveillance data to assess the extent and impact of infectious diseases, to evaluate the costs and benefits of public health efforts and to define important areas for research;
  - — operation of communications technology to facilitate national dissemination of data within disease reporting systems;
  - — dissemination of information to States and localities concerning threatening infectious disease agents and new prevention and control methods;
  - — provision of epidemiologic investigation and control services to facilitate response to infectious disease problems within medical care facilities as well as in the community.
- Technologic measures include:
  - — better design of medical devices and implants for safety and ease of sterilization or disinfection;
  - — improved water treatment systems;
  - — improved regulatory measures relating to food processing, food service and waste disposal;
  - — development and testing of new vaccines;
  - — development of new diagnostic tests for disease diagnosis and control;
  - — improved vector control and vector surveillance technology;
  - — improved design of health-care facilities to facilitate infection control practices (e.g., readily accessible sinks for handwashing between visits to patients).

b. Relative strength of the measures

- Surveillance, including epidemiologic investigations, is the basic and essential element of disease control. Historically, surveillance has provided the basis for understanding the major infectious diseases of man. It will remain essential to the future of infectious disease control. Improved surveillance systems will allow detection of new reservoirs of infection, definition of populations at risk, understanding of patterns of disease spread, and the evaluation of control measures. Surveillance systems will serve an increasingly important role in program evaluation (e.g., cost-benefit analyses) and the identification of new areas for intervention.
- Although health education measures lack rigorous evaluation, they have contributed substantially to curbing disease transmission. Further progress in preventing infectious diseases can be expected from public education measures in areas such as vaccine acceptance, proper use of antibiotics and the understanding of personal hygiene.
- The history of successful intervention in the control of food and waterborne diseases anticipates the development of new technologies for the control of infectious diseases and the application of new environmental control measures to large populations. In the hospital setting, the Study on the Efficacy of Nosocomial Infection Control (SENIC) is a model for evaluating environmental measures related to infectious disease problems of public health importance.

3. Specific Objectives for 1990

- Improved health status
  a. By 1990, the annual estimated incidence of hepatitis B should be reduced to 20 per 100,000 population. (In 1978, it was estimated to be 45 per 100,000 population.)
  b. By 1990, the annual reported incidence of tuberculosis should be reduced to 8 per 100,000 population. (In 1978, it was 13.1 per 100,000 population.)
  c. By 1990, the annual estimated incidence of pneumococcal pneumonia should be reduced to 115 per 100,000 population. (In 1978, it was estimated to be 182 per 100,000 population.)
  d. By 1990, the annual reported incidence of bacterial meningitis should be reduced to 6 per 100,000 population. (In 1978, it was estimated to be 8.2 per 100,000 population.)
  e. By 1990, the (risk factor-specific) incidence of nosocomial infection in acute care hospitals should be reduced by 20 percent of what otherwise would pertain in the absence of hospital control programs. (In 1979, it was estimated that 5 percent of all hospital patients suffered nosocomial infections and the overall rate of hospital acquired infections appears to be in-

creasing, although less so in hospitals with good infection control programs.) A similar percentage of reduction should be seen in long-term care and residential care facilities. (Baseline data unavailable.)

- Improved services/protection
  - f. By 1990, 95 percent of licensed patient care facilities should be applying the recommended practices for controlling nosocomial infectious. (Baseline data unavailable.)
  - g. By 1990, surveillance and control systems should be capable of responding to and containing: (1) newly recognized diseases and unexpected epidemics of public health significance; and (2) infections introduced from foreign countries.
  - *h. By 1990, at least 50 percent of people in populations designated as targets by the Immunization Practices Advisory Committee of the Public Health Service should be immunized within 5 years of licensure of new vaccines for routine clinical use.

    ***NOTE:** Same objective as for Immunization. Potential candidates include: hepatitis A and B; otitis media (*S. pneumoniae* and *H. influenza*); selected respiratory and enteric viruses; meningitis (group B *N. meningitides, S. pneumoniae, H. influenza*).
- Improved surveillance/evaluation systems
  - i. By 1990, data reporting systems in all States should be able to monitor trends of common infectious agents not now subject to traditional public health surveillance (respiratory illnesses, gastrointestinal illnesses, otitis media) and to measure the impact of these agents on health care cost and productivity at the local and State levels, and by extension at the National level.
  - j. By 1990, the extent of epidemics of respiratory and enteric viral illnesses should be predicted within 2 weeks after they appear, through community-wide sentinel surveillance systems.
  - k. By 1990, all State health departments should be linked by a computer system to Federal health agencies for routine collection, analysis and dissemination of surveillance data, rapid communication of messages, and epidemic aid investigations.
  - l. By 1990, laboratories throughout the country should be linked for monitoring infectious agents and antibiotic resistance patterns and for disseminating information.

4. Principal Assumptions

- Despite anticipated changes in antibiotic resistance patterns, there will be no dramatic changes in the projected evolution of infectious disease patterns before 1990—although disease agents will be newly recognized and epidemiologic patterns defined.
- Continuing change in the age structure of the U.S. population with increasing numbers of persons over 65 and a concomitant increase in the number and size of residential facilities for the elderly will be accompanied by a rise in the incidence of infectious disease.
- Current research efforts to understand the natural history of infectious diseases will be maintained, and improved tools for prevention, diagnosis and therapy will be developed.
- With the increased use of computer technology, there will be improvements in surveillance, communications and data analysis.
- There will be better dissemination of current technologies known to control disease, and new technologies will be developed (e.g., hepatitis B vaccine).
- There will be an increasing proportion of institutionalized patients with more serious illness who are subjected to a greater number of interventions and who are more prone to nosocomial infections.
- There will be an increased emphasis on the prevention and control of nosocomial infections, particularly in residential health-care facilities.
- Current Federal technical assistance and advisory services in epidemiology and program management will be maintained at the State and local level.
- There will be an improved use of diagnostic and therapeutic measures such as drugs for the treatment of viral diseases.
- There will be a continued overuse of antibiotic therapy as well as an increase in the development of antibiotic-resistant strains of bacteria such as the penicillin-resistant gonococcus.
- Because of increased international travel, there will be more opportunities for international spread of diseases.

5. Data Sources

a. To National level only

- National Hospital Discharge Survey (HDS) and National Ambulatory Medical Care Survey (NAMCS). Utilization of health manpower and facilities providing care for infectious diseases, ambulatory care, hospital care. DHHS-National Center for Health Statistics (NCHS). *Vital and Health Statistics*, Series 13. Continuing surveys; National probability samples.
- Health Interview Survey (HIS). Interview reports on infectious disease disability, use of hospital, medical, and other services, and other health-related topics. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 10. Continuing survey; National probability sample.
- Health Examination Survey and the Health and Nutrition Examination Survey (HANES). Nutrition risk factors for infectious disease, and medical sequelae from infectious disease (e.g., rheumatic fever). DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 11. Periodic surveys; National probability samples.

- Investigation of epidemics. DHHS-Centers for Disease Control (CDC). Continuous activity by CDC in response to epidemics of infectious disease activity throughout the U.S. Data periodically made available in reports and publications.
- Study on the Efficacy of Nosocomial Infection Control (SENIC). Hospital infection control activities and occurrence of hospital acquired infection. DHHS-CDC, Bureau of Epidemiology, Bacterial Diseases Division (BE-BDD). *The Journal of Epidemiology*, 111: 468–653 May 1980. Special issue on SENIC. One time study, stratified sample of U.S. hospitals.
- National Nosocomial Infections Study. Nosocomial infections. DHHS-CDC, BE–BDD. *National Nosocomial Infections Study Report* 80–8257. Continuous reporting from hospitals voluntarily cooperating with volunteer panel of 80 short stay hospitals.

b. To State and/or local level

- National Vital Registration System
  - — Mortality. Deaths by cause (including infectious diseases), by age, sex and race DHHS-NCHS. NCHS *Vital Statistics of the United States*, Vol II, and NCHS *Monthly Vital Statistics Reports*. Continuing reporting from States; National full count. (Many States issue earlier reports.)
- Hospitalized illness discharge abstract systems.
  - — Professional Activities Study (PAS). Patients in short stay hospitals; patient characteristics, diagnoses of infectious diseases, procedures performed, length of stays. Commission on Professional and Hospital Activities, Ann Arbor, Michigan. Annual reports and tapes. Continuous reporting from 1900 CPHA member hospitals; not a probability sample, extent of hospital participation varies by State.
  - — Medicare hospital patient reporting system (MEDPAR). Characteristics of Medicare patients, diagnosis, procedures. DHHS-Health Care Financing Administration, Office of Research, Demonstration and Statistics (ORDS). Periodic reports. Continuing reporting from hospital claim data; 20 percent sample.
  - — Other hospital discharge systems as locally available.
- National Morbidity and Mortality Reporting System. Numbers of 46 reportable diseases; deaths in 121 U.S. cities. DHHS-CDC. CDC *Morbidity and Mortality Weekly Report*, and annual reports. Morbidity: continuous reporting from State health departments on basis of physician reports. (Completeness of reporting varies greatly, since not all cases receive medical care and not all treated conditions are reported.) Mortality: continuous reporting; volunteer panel of health departments in 121 U.S. cities, full count.
- National surveillance data. Detailed data on cases of 33 communicable diseases. *Surveillance Reports*. DHHS-CDC, BE and Bureau of State Services. Continuous reporting from States.
- Third party payers and large group practices can sometimes provide data on diagnosis, cost and demographic features of defined patients and populations. Data are collected on a continuous basis but are not consistently analyzed or distributed.
- State disease surveillance systems. Report of notifiable diseases required by State law (as many as 100 in some States); analyzed and periodically published by each of the States.
- Special periodic Statewide studies to monitor disease activity or to evaluate the effectiveness of disease control programs available at State health departments.
- Statewide accounting procedures to document public health activities available through the National Public Health Reporting System of the Association of State and Territorial Health Officers as well as individual State health departments.
- Investigation of epidemics. Continuous activity by Federal, State and local health departments in response to epidemic infectious disease activity. Data periodically made available by responsible health authorities.

SMOKING AND HEALTH

1. Nature and Extent of the Problem

Smoking, the single most important preventable cause of death and disease, is associated with heart and blood vessel diseases, chronic bronchitis and emphysema, cancers of the lung, larynx, pharynx, oral cavity, esophagus, pancreas, and bladder, and with other problems such as respiratory infections and stomach ulcers. Though the share of the population who smoke has declined for the country as a whole, the declines have not been as great among adolescents and there have even been increases in the rates for 17 and 18 year-old women. To reduce the prevalence of smoking in this country, a variety of approaches are needed to discourage young people from starting to smoke, to increase the number of smokers who quit, and to assist those who continue to smoke to do so, to the extent possible, in less hazardous ways. Particular attention should be given to high risk groups such as pregnant women, children and adolescents who initiate smoking at a young age, and workers who are exposed to occupational hazards that are exacerbated by cigarette smoking.

a. Health implications

- Cigarette smoking is responsible for approximately 320,000 deaths annually in the United States.
- Lung cancer is the leading cause of cancer death among men; if present trends continue, by 1983 it will become the leading cause of cancer death among women.
- Cigarette smoking is a causal factor for: coronary heart disease and arteriosclerotic peripheral vascular disease; cancers of the lung, larynx, oral cavity, esophagus, pancreas and bladder; and chronic bronchitis and emphysema.
- Cigarette smoking during pregnancy is associated with retarded fetal growth, an increased risk for spontaneous abortion and prenatal death, as well as slight impairment of growth and development during early childhood.
- Cigarette smoking acts synergistically with oral contraceptives to enhance the probability of coronary and cerebrovascular disease; with alcohol to increase the risk of cancer of the larynx, oral cavity and esophagus; with asbestos and other occupationally encountered substances to increase the likelihood of cancer of the lung; and with other risk factors to enhance cardiovascular risk.
- Involuntary or passive inhalation of cigarette smoke can precipitate or exacerbate symptoms of existing disease states such as asthma, cardiovascular and respiratory diseases. Pneumonia and bronchitis are more common among infants whose parents smoke.
- Smoking is a major contributor to death and injury from fires, burns and other accidents. Twenty-nine percent of fatal house fires and a substantial number of burn injuries are smoking related.
- Ten years after quitting cigarette smoking, the death rates for lung cancer and other smoking-related causes of death approach those of nonsmokers.

b. Status and trends

- Adult per capita consumption of cigarettes decreased temporarily in 1953, 1954, 1964, and 1968–1970, coinciding with periods of increased national publicity on health hazards of smoking. The rate of decline has accelerated since 1977.
- The percentage of adult men who regularly smoke declined from 53 percent to 38 percent between 1955 and 1978.
- The percentage of adult women who regularly smoke increased from 25 percent to 33 percent between 1955 and 1965, decreasing to 30 percent by 1978.
- The percentage of all adults who smoke regularly was about 33 percent in 1978, the lowest point in over 30 years. Smoking cigarettes is significantly less prevalent in higher educated groups. The decline since 1966 involves all socioeconomic groups but cigarette smoking rates among blacks still exceed those among whites. Most of the decrease seen in smoking prevalence among adults is explained by smoking cessation rather than by a lower rate of initiation.
- Teenage smoking has declined since 1974, except for young women aged 17 to 18. Rates for women aged 17 to 24 have risen and now exceed those of men in this age group.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:

60

- general educational campaigns using broadcast and other mass media, coordinated with government, business and nonprofit voluntary efforts, focusing on such subjects as specific health consequences, self-initiated cessation, less hazardous ways of smoking, the immediate benefits of cessation and the effects of passive smoking on infants and on people with pre-existing heart and lung conditions;
- specific educational campaigns directed: to women, focusing on the special health consequences of cigarette smoking for pregnant women (and fetus) or for women using oral contraceptives; to youth and to people in lower socioeconomic groups, focusing on immediate consequences and how to deal with social pressures to smoke; to workers exposed to toxic agents and to others at special risk to health, focusing on the synergistic and additive effects of smoking for those exposed to occupational hazards; and to those with other risk factors, such as high blood pressure;
- special smoking education programs reaching high risk groups;
- youth smoking prevention programs, especially in grades 7 through 10, focused on the psychosocial factors which promote smoking, which will impart knowledge and skills necessary to help resist social influences (e.g., using nonsmoking peer models);
- media programs focused on self-initiated cessation, referring people to materials appropriate to their special risks and dealing with common relapse situations;
- advising consumers to consider carbon monoxide as well as levels of "tar" and nicotine;
- warning consumers that changing to cigarettes with lower yields of tar and nicotine may increase smoking hazards if accompanied by smoking more cigarettes, inhaling more deeply or starting smoking earlier in life;
- cautioning consumers that even the lowest-yield cigarettes present health hazards much greater than those encountered by nonsmokers, and that the most effective way to reduce the hazards of smoking is not to start or to quit.

- Service measures include:
  - formal and self-help smoking cessation programs made more available within the health care system, occupational settings, union facilities and places convenient to the general public;
  - coordination and exchange of programs and materials between Government, business, commercial and nonprofit agencies;
  - expanded direct counseling and patient education by health care providers;
  - specialized service programs for women, for pregnant women, for occupational and other high risk groups and other smokers in particular need of assistance in stopping smoking—to be carried on through community, church, social and health organizations and at the work place.
- Technologic measures include:
  - continuing engineering and research on the development of less hazardous ways of smoking including the development of cigarettes with lower yields of incriminated ingredients and the development of methods to assess the relative risks of cigarettes with lower yields.
- Legislative and regulatory measures include:
  - continuing the ban on TV and radio advertising and the requirement of a health warning on all cigarette packages;
  - continuing the FTC requirement of a health warning in advertising;
  - improving enforcement of laws prohibiting sales to minors;
  - strengthening State and local laws and regulations which establish nonsmoking areas in public places and work areas;
  - examining potential new areas of regulation, such as: increased disease-specific information in advertisements; deglamorizing the visual and printed components of advertising; requiring greater visibility of warnings; requiring that tar and nicotine yields be placed on the package; banning distribution of cigarette samples to minors.
- Economic measures include:
  - tax policies *vis-a-vis* cigarettes;
  - income tax deduction policy for the cost of smoking cessation programs;
  - encouraging employers to provide bonuses and other incentives to workers who quit;
  - "no smoking" policies for workplaces where smoking on the job presents particular hazards;
  - encouraging insurance companies to examine feasibility of offering preferential life and/or health insurance premiums to nonsmokers and of paying for smoking cessation programs offered to group insurance subscribers.

b. Relative strength of the measures

- Education, information, fiscal and regulatory measures are key strategies in a National smoking prevention program. Education is the priority in such programs, especially related to children and pregnant women. Additional research is needed to define the types of education which best meet public needs.

- The major gains may come through the identification of effective peer education strategies for children and youth.
- Counseling by physicians and health professionals on smoking would facilitate the decline in smoking if incorpoarted into routine clinical practice.
- Legislative, regulatory and economic measures (including taxation), consistently and vigorously applied, should enhance the educational efforts, but are less likely to be successfully enacted.
- If cigarettes with lower tar and nicotine should prove to be less hazardous for some smoking-related diseases (as current evidence suggests), the substitution of lower level cigarettes for those with higher levels may prove a valuable aid in reducing disease through less desirable than not smoking at all.

3. Specific Objectives for 1990 or Earlier

- Improved health status
  - Reductions in smoking can be expected to yield reduced rates of coronary heart disease, chronic lung disease, prematurity in newborns, smoking related fire deaths and fewer occupational illnesses from exposure to substances with which cigarette smoking acts synergistically. Over the longer term, reductions in cancer rates (especially lung and bladder) can also be expected. Because of uncertainties in short-term quantification of the exposure-to-disease relationship, measurable health status objectives are not stated.
- Reduced risk factors
  - a. By 1990, the proportion of adults who smoke should be reduced to below 25 percent. (In 1979, the proportion of the U.S. population which smoked was 33 percent.)
  - b. By 1990, the proportion of women who smoke during pregnancy should be no greater than one half the proportion of women overall who smoke. (Baseline data unavailable.)
  - c. By 1990, the proportion of children and youth aged 12 to 18 years old who smoke should be reduced to below 6 percent. (In 1979, the proportion of 12 to 18 year olds who smoked was 11.7 percent.)
  - d. By 1990, the sales-weighted average tar yield of cigarettes should be reduced to below 10 mg. The other components of cigarette smoke known to cause disease should also be reduced proportionately. (In 1978, the sales-weighted average yield was 16.1 mg.)
- Increased public/professional awareness
  - e. By 1990, the share of the adult population aware that smoking is one of the major risk factors for heart disease should be increased to at least 85 percent. (In 1975, the share was 53 percent.)
  - f. By 1990, at least 90 percent of the adult population should be aware that smoking is a major cause of lung cancer, as well as multiple other cancers including laryngeal, esophageal, bladder and other types. (Baseline data unavailable.)
  - g. By 1990, at least 85 percent of the adult population should be aware of the special risk of developing and worsening chronic obstructive lung disease, including bronchitis and emphysema, among smokers. (Baseline data unavailable.)
  - h. By 1990, at least 85 percent of women should be aware of the special health risks for women who smoke, including the effect on outcomes of pregnancy and the excess risk of cardiovascular disease with oral contraceptive use. (Baseline data unavailable.)
  - i. By 1990, at least 65 percent of 12 year olds should be able to identify smoking cigarettes with increased risk of serious disease of the heart and lungs. (Baseline data unabailable.)
- Improved services/protection
  - j. By 1990, at least 35 percent of all workers should be offered employer/employee sponsored or supported smoking cessation programs either at the worksite or in the community. (In 1979, 15 percent of U.S. business firms had programs to encourage or assist their employees in smoking cessation.)
  - k. By 1985, tar, nicotine and carbon monoxide yields should be prominently displayed on each cigarette package and promotional material. (Carbon monoxide levels are not currently required.)
  - l. By 1985, the present cigarette warning should be strengthened to increase its visibility and impact, and to give the consumer additional needed information on the specific multiple health risks of smoking. Special consideration should be given to rotational warnings and to identification of special vulnerable groups.
  - m. By 1990, laws should exist in all 50 States and all jurisdictions prohibiting smoking in enclosed public places, and establishing separate smoking areas at work and in dining establishments. (In 1978, 31 States had some form of smoking restriction laws.)
  - n. By 1990, major health and life insurers should be offering differential insurance premiums to smokers and nonsmokers. (In 1979, approximately 30 major companies were offering differential premiums.)
- Improved surveillance/evaluation
  - o. By 1985, insurance companies should have collected, reviewed, and made public their actuarial experience on the differential life experience and hospital utilization by specific cause among smokers and nonsmokers, by sex.
  - p. By 1990, continuing epidemiological research should have delineated the unanswered research questions regarding low yield cigarettes, and

preliminary partial answers to these should have been generated by research efforts.

q. By 1990, in addition to biomedical hazard surveillance, continuing examination of the changing tobacco product, and the sociologic phenomena resulting from those changes should have been accomplished.

4. Principal Assumptions

- Policy, planning and programs to reduce smoking will continue to be high priorities of government, voluntary agencies and industry.
- Educational programs to reduce smoking in youth, women, pregnant women, high risk occupations and populations and lower socio-economic groups will become more intensive.
- There will be a gradual increase in the availability and use of smoking cessation service programs.
- Smoking education will be increasingly integrated into positive lifestyle promotion programs.
- The social acceptability of smoking will continue to decrease.
- There will be a continued decline in smoking among upper socioeconomic classes, spreading to lower socioeconomic classes.
- Regulations against smoking in public places will increase, providing incentives and social supports to reduce smoking.
- The decline in sales-weighted average tar content of cigarettes will continue.
- Engineering measures will help reduce the yields by cigarettes of hazardous particulants and the gaseous ingredients of smoke.
- There will be no dramatic change in tax policy on cigarettes.

5. Data Sources

a. To National level only

- Knowledge, attitudes and practices in cigarette use. Demographic data, attitudes, information and beliefs about cigarette use, and smoking practices among people 21 years of age or older, and changes between 1964 and 1970. DHEW National Clearinghouse for Smoking and Health (now/Office on Smoking and Health) Reports: *Use of Tobacco: Practices, Attitudes, Knowledge and Beliefs 1964–1966*; and *Adult Use of Tobacco–1970/Adult Use of Tobacco, 1975*. Longitudinal study of panel first interviewed 1964; follow up interviews in 1966 and 1970: one time survey (new sample), 1975.
- Teenage smoking. Demographic data, attitudes, beliefs and knowledge concerning smoking among adolescents in the United States. Office on Smoking and Health (formerly National Clearinghouse for Smoking and Health) 1968–1974; National Institute of Education 1979. *Teenage Smoking: National Patterns of Cigarette Smoking, Age 12 through 18*. Published in 1968, 1970, 1972 and 1974. (In 1979 title was changed to: *Teenage Smoking: Immediate and Long Term Patterns*). Surveys of adolescents ages 12–18 respondent sample of general U.S. population.
- Smoking behavior and attitudes of health professionals. Office on Smoking and Health (formerly National Clearinghouse for Smoking and Health). *Smoking Behavior and Attitudes: Physicians, Dentists, Nurses, and Pharmacists, 1975*. One time survey.
- Health Interview Survey (HIS): Smoking Supplement. Smoking prevalence among adults collected as part of the Health Interview Survey. DHHS-National Center for Health Statistics (NCHS). NCHS *Advance Data from Vital and Health Statistics* and Surgeon General reports on smoking usually annual. 1980 Surgeon General's report entitled *Health Consequences for Women: A Report of the Surgeon General*. Continuing survey; National probability sample. Smoking supplements periodic since 1978.
- Health and Nutrition Examination Survey (HANES). Clinical and biochemical data on examinees collected, could be analyzed according to their smoking characteristics. DHHS–NCHS. NCHS *Vital and Health Statistics*, Series 11. Periodic survey; National probability sample.
- Cigarette and cigar production and imports. Number of cigarettes (large and small) and cigars, by size and class, shipped from factory or imported each month by manufacturer. Department of Treasury-Bureau of Alcohol, Tobacco and Firearms. Monthly statistical release, *Cigarettes and Cigars*. Continuing; reports from manufacturers, importers.
- Tobacco crops. Average yield, stock, supply, domestic use, price and crop value. Department of Agriculture, Agricultural Marketing Service. *Annual Report on Tobacco Statistics*. Continuing.
- "Tar" and nicotine content. Results of "tar" and nicotine yield measurements of cigarettes by brand. Federal Trade Commission, annual report. *"Tar" and Nicotine Content of the Smoke of 176 Varieties of Cigarettes*. Continuing analysis and reports.
- Cigarette marketing and regulatory issues. Annual review of current issues in labeling and advertising, advertising themes and costs, regulatory activity, legislative recommendations, types of cigarettes marketed. Some trend data. Federal Trade Commission. *Annual Report to Congress Pursuant to the Public Health Cigarette Smoking Act*. Continuing.

b. To State and/or local level

- National Vital Registration System
  - — Mortality. Deaths by cause (including smoking related diseases), by age, sex, and

race. DHHS–NCHS. NCHS *Vital Statistics of the United States,* Vol II, and NCHS *Monthly Vital Statistics Reports.* Continuing reporting from States; National full count. (Many States issue earlier reports.)

- Hospitalized illness discharge abstract systems.
  - — Professional Activities Study (PAS). Patients in short stay hospitals; patient characteristics, diagnoses of lung cancer and other smoking related diseases, procedures performed, length of stays. Commission on Professional and Hospital Activities, Ann Arbor, Michigan. Annual reports and tapes. Continuous reporting from 1900 CPHA member hospitals; not a probability sample, extent of hospital participation varies by state.
  - — Medicare Hospital Patient Reporting System (MEDPAR). Characteristics of Medicare patients, diagnoses, procedures. DHHS–Health Care Financing Administration, Office of Research, Demonstration and Statistics (ORDS). Periodic reports. Continuing reporting from hospital claim data; 20 percent sample.
  - — Other hospital discharge systems as locally available.
- Cigarette sales. Number of cigarette packages taxed for each month in each State, and comparison to one year previously. Tobacco Tax Council, 5407 Patterson Avenue, Richmond, Virginia: Monthly State Cigarette Tax Report. Continuing.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and County level from various sources. DHHS–Health Resources Administration. *Area Resource File: A Manpower Planning and Research Tool.* DHHS–HRA–80–4, Oct 79. One time compilation.
- Selected health data. DHHS–NCHS. NCHS *Statistical Notes for Health Planners.* Compilations and analysis of data to State level.

MISUSE OF ALCOHOL AND DRUGS

1. Nature and Extent of the Problem

A major objective of the drug and alcohol prevention policy is to reduce the adverse social and health consequences associated with the misuse of these substances, especially among adolescents, young adults, pregnant women and the elderly.

Alcohol and other drug problems have pervasive effects: biological, psychological and social consequences for the abuser; psychological and social effects on family members and others; increased risk of injury and death to self, family members and others (especially by accidents, fires or violence); and derivative social and economic consequences for society at large. Destructive drug and alcohol use shares many similarities with tobacco use and may respond to some of the same prevention strategies (see Smoking and Health).

Per capita alcohol consumption and use of other drugs for non-medical purposes decreases with older age groups, but the use of drugs for medical purposes, both over-the-counter and prescription drugs, increases.* Since the aging process is accompanied by physiologic changes that alter the body's response to both food and drugs, practices of self-medication, over-prescribing and the concurrent use of two or more drugs can create serious health problems for the elderly. Concurrent misuse of alcohol and drugs consumed for either non-medical or medical purposes increases risks to health and complicates the delivery and financing of preventive and treatment measures from both private and public sources.

***NOTE:** For purposes of this report, the term "use of other drugs" refers to self-reported use of licit or illicit drugs for non-medical or self-defined purposes. It does not include inappropriate use of drugs consumed for medical purposes, nor the use of alcohol or tobacco. These are discussed separately.

a. Health implications

ALCOHOL

- In 1975, an estimated 36,000 deaths from cirrhosis, alcoholism or alcoholic psychosis could be directly attributed to alcohol use.
- In 1975, an additional 51,000 fatalities could be indirectly attributed to alcohol use.
- Alcohol has been identified as a risk factor for cancers of the oral cavity, esophagus and liver.
- In 1977, about 45 percent of all motor vehicle fatalities involved drivers with blood alcohol levels of .10 percent or more, a rate of 11.5 per 100,000 population.
- In 1975, the costs of alcohol problems were estimated to be $43 billion in lost production, health and medical services, accidents, crime and other social consequences.
- The Fetal Alcohol Syndrome is estimated to cause some 1,400 to 2,000 birth defects annually.

OTHER DRUGS

- The vast majority of users of "other drugs" are marijuana users, but the category is not limited to this group.
- The social cost of drug abuse, including law enforcement, has been estimated to be at least $10 billion per year, a figure which may be an underestimate considering the difficulties of measuring the aggregate health and social consequences of those behaviors.
- Between May 1976 and April 1977, there were an estimated 7,000 to 8,000 deaths and an estimated 275,000 to 300,000 medical emergencies related to misuse of drugs.
- An undetermined portion of deaths and medical emergencies relate to drug use for suicide and attempted suicide (see Control of Stress and Violent Behavior) and may be very difficult to prevent.
- Barbiturates were the class of drugs mentioned most frequently by medical examiners in connection with drug-related deaths reported to the Drug Abuse Warning Network between May 1977 and April 1978 (2 percent of drugs mentioned).
- Tranquilizers were the class of drugs mentioned most frequently by emergency rooms during the same period (24 percent of drugs mentioned).
- The proportion of barbiturate and tranquilizer misuse that is deliberate and the proportion that is accidental is not known.

DRUGS USED FOR MEDICAL PURPOSES

- Use of high estrogen content oral contraceptives by women smokers increases risks of coronary and cerebrovascular disease.
  — See Family Planning
- People over 65 years of age, 11 percent of the population, use more drugs and for longer periods of time than any other age group, ac-

counting for 30 percent of all medicines consumed.

- The risk of adverse drug reactions in elderly patients is almost twice that in patients between 30 and 40 years of age.
- Between 70 and 80 percent of reactions are predictable and preventable.
- Between 0.3 and 1.0 percent of the nation's total 35.5 million hospital admissions each year are due to adverse drug reactions.
- Improper use of drugs forces curtailment of normal activities, or contributes to such curtailment, in an unknown proportion of the disabled population.

b. Status and trends

ALCOHOL

- An estimated 10 percent of the adult population 18 years and over are frequent heavy drinkers (5 or more drinks per occasion at least once per week).
- Most problems indirectly attributable to alcohol (homicides, car crashes) have the highest rates among young adult males ages 18 to 24 years.
- National surveys indicate no changes in peak quantity consumed by teenagers 12 to 17 (five or more beers at a time) or in regularity of their drinking, between 1974 and 1978.
- Alcoholism mortality rates (2 per 100,000) and alcoholic psychosis rates (1 per 100,000) show little overall increase between 1950 and 1975.
- Based on survey reports and tax-paid withdrawals, per capita consumption of absolute alcohol did not change significantly during the years 1971 to 1976. More recent data indicate that per capital consumption began to increase again after 1976, from 2.7 gallons to 2.82 gallons of absolute alcohol per capita in 1978. Whether the increase will continue is not yet known.

OTHER DRUGS

- A dramatic decline in level of heroin-related medical problem indicators was seen from 1976 to 1977, suggesting a decline in heroin use.
- The proportion of adolescents (12 to 17 years old) reporting current use of marijuana has been rising continuously for the last decade and has increased significantly from 6 percent in 1971 to 16 percent in 1977.
- The proportion of young adults (18 to 25 years old) reporting that they had ever used marijuana rose from 39 percent in 1971 to 60 percent in 1977.
- It has been estimated that there are approximately 2,500,000 persons (roughly 2 percent of the population age 18 and over) having serious drug problems.
- Epidemiological evidence suggests that the use of alcohol, tobacco and marijuana by adolescents is associated.

DRUGS USED FOR MEDICAL PURPOSES

- Barbiturate-related mortality accounted for less than 1,300 deaths in 1976.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - — general public information campaigns, and programs targeted to children and youth and to specific at-risk populations, with specific messages to facilitate problem recognition or reinforce desired behavior;
  - — programs targeted at a wide array of service professions concerning the recognition of, and responses to, alcohol and other drug problems;
  - — information on medicine labels on drug/drug, drug/food and drug/alcohol interactions, with practical guidance on avoiding clinically significant interactions;
  - — school and community-based health education programs, some using peer leaders and models;
  - — special education programs emphasizing effective risk-management skills and alternatives to drug and alcohol use;
  - — education of physicians, nursing home staff and patients about hazards surrounding the misuse of tranquilizers, hypnotics and other classes of prescription and nonprescription drugs;
  - — easily understandable information available to patients taking drugs for medical purposes.
- Service measures include:
  - — programs which offer general social support (youth centers, recreation programs) and thereby provide alternatives to drug and alcohol use;
  - — outreach and early intervention services at the worksite and in community settings for persons whose behavior indicates that they are at-risk for the development of alcohol or other drug problems;
  - — anticipatory guidance, identification of children at high risk of alcoholism;
  - — a broad range of treatment services in employee assistance programs, in general health care delivery settings and in specialized alcohol and drug facilities;
  - — counseling by pharmacists to older people taking drugs for medical purposes;
  - — maintenance of computerized drug profiles;
  - — hotlines and drug information centers people can use to learn about drug effects and interactions.
- Technologic measures include:
  - — product safety changes which reduce the risk of injury and death in places associated with use of alcohol and other drugs (e.g., airbags

in motor vehicles and improved fireproofing in residences);
  - modification to alcoholic beverages themselves (e.g., reduction of alcohol content, reduction or elimination of nitrosamines);
  - efforts by community institutions to modify social settings and contexts to reduce the risk associated with intoxication and to alter social reaction to some types of drinking or drug-using behavior.

- Legislative and regulatory measures include:
  - regulating the conditions of availability of alcoholic beverages (i.e., zoning regulations regarding hours of sale, numbers of outlets and numbers of licenses);
  - enforcing minimum drinking age laws and employing legal disincentives to discourage the dispensing of alcohol to obviously intoxicated persons;
  - enforcing laws prohibiting driving while intoxicated by alcohol or drugs and initiating stronger legal disincentives;
  - controlling advertising of alcoholic beverages;
  - enforcing laws related to production, distribution and use of "other drugs" that are proscribed except for medical and scientific purposes; special law enforcement agencies are responsible for enforcing such prohibitions and violations are punishable by criminal sanctions;
  - regulation of conditions under which these substances are available for authorized uses, such as measures relating to scheduling of "controlled substances' and limitations on prescriptions;
  - periodic re-examination of sanctions to ensure correspondence to the degree of severity of the health and social problems associated with the overuse of each particular substance or drug;
  - patient labeling for certain prescription drugs (estrogens, progestins);
  - drug information for patients in nursing homes and in other long-term care facilities.

- Economic measures include:
  - excise taxes on alcoholic beverages and other means of affecting the price of alcohol;
  - tax incentives or disincentives to control levels of advertising expenditures for alcoholic beverages.

b. Relative strength of the measures

- Systematic evaluation of the effects of education and yearly intervention programs targeted at children and youth and populations at special risk is at an early stage.
- Regulatory measures have been the Nation's primary tool of drug abuse prevention during most of the 20th century. There is much debate about the overall cost-benefit assessment of the current prohibitions. From a more limited perspective, however, some recent trends tend to support claims that regulatory approaches have had an impact on the extent of drug use.
- Heroin addiction in this country has been declining in recent years, coincident with reduced supplies on the illegal market and the extensive availability of treatment services. Late in 1979, however, the supply and incidence of heroin use increased in several Eastern cities. Also, barbiturate-related mortality has been declining steadily as a result of increased legal controls, greater physician awareness of the most efficacious uses of these drugs, and improved public awareness of the hazards associated with the use of barbiturates in combination with other depressants.
- Mass media campaigns that have focused public attention upon alcohol use and abuse may have contributed to a period of relative stability in alcohol consumption during the seventies (although economic conditions were also a likely significant factor). Alcohol problems, as noted by several indicators (cirrhosis mortality rate decline, survey data on alcohol consumption among youth and adults), appear also to have leveled off during this period of apparent stability. While direct causal attribution is not possible, the creation of a National alcoholism treatment network and early intervention services in the workplace probably played a role in the stabilization of cirrhosis deaths.
- Alcoholic beverage regulation has not traditionally been focused on public health considerations, but data concerning the impact of regulatory initiatives on tobacco smoking may be transferable to the alcohol area. Research here and in other countries suggests that the availability of alcohol may affect the level and type of alcohol problems, particularly physical health problems consequent to long-term excessive drinking. Consumption, in turn, has been linked fairly conclusively to the relative price of alcohol, and less conclusively to such factors as the legal purchase age, number and dispersion of retail on-premise and off-premise outlets, and hours of sale. Also "Dram Shop" laws can offer powerful incentives for alcoholic beverage licensees to try to reduce the likelihood of intoxication among their patrons.
- In general, alcohol and drug education programs can increase information levels and modify attitudes. Their effect on drinking or drug-using behavior has not yet been demonstrated conclusively, although recent studies have yielded encouraging preliminary findings.

3. Specific Objectives for 1990

- Improved health status
  a. By 1990, fatalities from motor vehicle accidents

involving drivers with blood alcohol levels of .10 percent or more should be reduced to less than 9.5 per 100,000 population per year. (In 1977, there were 11.5 per 100,000 population.)

b. By 1990, fatalities from other (non-motor vehicle) accidents, indirectly attributable to alcohol use, e.g., falls, fires, drownings, ski mobile, aircraft) should be reduced to 5 per 100,000 population per year. (In 1975, there were 7 per 100,000 population.)

c. By 1990, the cirrhosis mortality rate should be reduced to 12 per 100,000 per year. (In 1978, the rate was 13.8 per 100,000 per year.)

*d. By 1990, the incidence of infants born with the Fetal Alcohol Syndrome should be reduced by 25 percent. (In 1977, the rate was 1 per 2,000 births, or approximately 1,650 cases.)

***NOTE:** Same objective as for Pregnancy and Infant Health.

e. By 1990, other drug-related mortality should be reduced to 2 per 100,000 per year. (In 1978, the rate was about 2.8 per 100,000.)

f. By 1990, adverse reactions from medical drug use that are sufficiently severe to require hospital admission should be reduced to 25 percent fewer such admissions per year. (In 1979, estimates range from approximately 105,000 to 350,000 admissions per year.)

- Reduced risk factors

g. By 1990, per capita consumption of alcohol should not exceed current levels. (In 1978, about 2.82 gallons of absolute alcohol were consumed per year per person age 14 years and over.)

h. By 1990, the proportion of adolescents 12 to 17 years old who abstain from using alcohol or other drugs should not fall below 1977 levels. (In 1977, the proportion of abstainers was: 46 percent for alcohol; for other drugs, ranging from 89 percent for marijuana to 99.9 percent for heroin.*)

***NOTE:** A person is defined as not using alcohol or other drugs if he or she has never used the substance or if the last use of the substance was more than one month earlier.

i. By 1990, the proportion of adolescents 14 to 17 years old who report acute drinking-related problems during the past year should be reduced to below 17 percent.* (In 1978, it was estimated to be 19 percent based on 1974 survey data.)

***NOTE:** Acute drinking-related problems have been defined as problems such as episodes of drunkenness, driving while intoxicated, or drinking-related problems with school authorities.

j. By 1990, the proportion of problem drinkers among all adults aged 18 and over should be reduced to 8 percent. (In 1979, it was about 10 percent.)

k. By 1990, the proportion of young adults 18 to 25 years old reporting frequent use of other drugs should not exceed 1977 levels. (In 1977, it was less than one percent for drugs other than marijuana and 19 percent for marijuana.*)

***NOTE:** "Frequent use of other drugs" means the non-medical use of any specific drug on 5 or more days during the previous month.

l. By 1990, the proportion of adolescents 12 to 17 years old reporting frequent use of other drugs should not exceed 1977 levels. (In 1977, it was less than 1 percent for drugs other than marijuana and 9 percent for marijuana.)

- Increased public/professional awareness

m. By 1990, the proportion of women of childbearing age aware of risks associated with pregnancy and drinking, in particular, the Fetal Alcohol Syndrome, should be greater than 90 percent. (In 1979, it was 73 percent.)

n. By 1990, the proportion of adults who are aware of the added risk of head and neck cancers for people with excessive alcohol consumption should exceed 75 percent. (Baseline data unavailable.)

o. By 1990, 80 percent of high school seniors should state that they perceive great risk associated with frequent regular cigarette smoking, marijuana use, barbiturate use or alcohol intoxication. (In 1979, 63 percent of high school seniors perceived "great risk" to be associated with 1 or 2 packs of cigarettes smoked daily, 42 percent with regular marijuana use, 72 percent with regular barbiturate use, and only 35 percent with having 5 or more drinks per occasion once or twice each weekend.)

p. By 1990, pharmacists filling prescriptions should routinely counsel patients on the proper use of drugs designated as high priority by the FDA, with particular attention to prescriptions for pediatric and geriatric patients and to the problems of drinking alcoholic beverages while taking certain prescription drugs. (Baseline data unavailable.)

- Improved services/protection

q. By 1990, the proportion of workers in major firms whose employers provide a substance abuse prevention and referral program (employee assistance) should be greater than 70 percent. (In 1976, 50 percent of a sample of the Fortune 500 firms offered some type of employee assistance program.)

r. By 1990, standard medical and pharmaceutical practice should include drug profiles on 90 percent of adults covered under the Medicare program, and on 75 percent of other patients with acute and chronic illnesses being cared for in all private and organized medical settings. (Baseline data unavailable.)

- Improved surveillance/evaluation systems
  - s. By 1990, a comprehensive data capability should be established to monitor and evaluate the status and impact of misuse of alcohol and drugs on: health status; motor vehicle accidents; accidental injuries in addition to those from motor vehicles; interpersonal aggression and violence; sexual assault; vandalism and property damage; pregnancy outcomes; and emotional and physical development of infants and children.

4. Principal Assumptions

- The Federal emphasis on research and technical assistance will continue, with primary reliance on State and local governments and the voluntary sector for delivery of alcohol and drug abuse prevention services.
- Resources and services devoted by State and local governments, and voluntary groups, for drug and alcohol prevention programs and services will expand.
- Federal funding for research and evaluation in drug and alcohol prevention will modestly increase, with special attention to the priority areas reflected in the proposed objectives.
- Federal information initiatives will continue to sensitize the public to the adverse social and health consequences of heavy or frequent use of alcohol and other drugs.
- Strong and varied initiatives both public and private, will seek to minimize use of tobacco, alcohol and other drugs by children and adolescents—including coordinated efforts with alcohol producers, distributors, retailers and State alcohol control commissions.
- The allocation of resources by alcohol producers, distributors and retailers to the marketing, promotion and distribution of alcoholic beverages will probably increase
- No dramatic shift in tax or regulatory policies toward availability and consumption of alcoholic beverages will occur, unless consumption trends require reconsideration.
- There will be no dramatic or permanent shift in the availability of controlled substances outside legitimate medical and scientific channels.
- The trend will continue toward modification of the criminal law and its less punitive administration in cases involving arrests for personal possession of marijuana and other drugs.

5. Data Sources

a. To National level only

- Health Interview Survey (HIS). Accidental injuries, disability, use of hospital, medical and other services, and other health-related topics. DHHS-National Center for Health Statistics (NCHS). NCHS *Vital and Health Statistics*, Series 10, selected reports, and *Advance Data*, selected reports. Continuing household interview survey; National probability samples.
- Health Examination Survey (HES) and the Health and Nutrition Examination Survey (HANES). Alcohol and drug related conditions. DHHS-NCHS. *Vital and Health Statistics*, Series 11, selected reports. Periodic surveys; National probability samples; data obtained from physician's examinations.
- National Hospital Discharge Survey (HDS). Utilization of hospital services related to misuse of alcohol and drugs. DHHS-NCHS *Vital and Health Statistics*, Series 13. Continuing; National probability sample, short stay hospitals.
- National Ambulatory Medical Care Survey (NAMCS). Alcohol and drug related patient-physician encounters. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 13. Continuing survey; National probability sample, office based physicians.
- The lifestyle and values of youth. Non-medical use of substances in 12 categories including marijuana, barbiturates, cocaine, prescription drugs, alcohol, cigarettes. DHHS-NIDA. *Drugs in the Class of (survey year date), Behaviors, Attitudes and Recent National Trends*, series Number 20. Annual surveys since 1975 of high school seniors in a National sample of public and private schools.
- The National Survey on Drug Abuse. Estimates of the levels of illicit and legal drug use in the United States: marijuana-hashish, cocaine, hallucinogens, heroin and other opiates; summary of data on use of inhalants, alcohol, cigarettes and the non-medical use of psychotherapeutic drugs legally prescribed. DHHS-NIDA. *Highlights from the National Survey on Drug Abuse, 1977*. Continuing survey since 1971; National sample.
- Drug Abuse Warning Network (DAWN). Drug abuse encountered in emergency rooms and medical examination offices. DHHS-NIDA and the Drug Enforcement Administration. Quarterly reports of provisional data *Series G*, NIDA. Continuing survey in 26 standard metropolitan statistical areas.
- National Prescription Audit (NPA). Drug sales, including barbiturates, tranquilizers; source of prescription; payment status, provider type. IMS America, Ltd., Ambler, Pennsylvania. IMS reports. Continuing audit of pharmacies on IMS panel.
- *Third Special Report to the U.S. Congress on Alcohol and Health*, June 1978. Subsequent reports will be available approximately every three years.

b. To State and/or local level

- National Vital Registration System
  - — Mortality. Deaths by cause (including alcohol and drug related), by age, sex and race, DHHS-NCHS. NCHS *Vital Statistics of the United States*, Vol II, and NCHS *Monthly Vital Statistics Reports*. Continuing reporting from States; National full count. (Many States issue earlier reports.)
- Hospitalized illness discharge abstract systems.
  - — Professional Activities Study (PAS). Patients in short stay hospitals; patient characteristics, alcohol and drug related diagnoses, procedures performed, length of stays. Commission on Professional and Hospital Activities, Ann Arbor, Michigan. Annual reports and tapes. Continuous reporting from 1900 CPHA member hospitals; not a probability sample, extent of hospital participation varies by State.
  - — Medicare hospital patient reporting system (MEDPAR). Characteristics of Medicare patients, diagnosis, procedures. DHHS-Health Care Financing Administration, Office of Research, Demonstration and Statistics (ORDS). Periodic reports. Continuing reporting from hospital claim data; 20 percent sample.
  - — Other hospital discharge systems as locally available.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and county level from various sources. DHHS-Health Resources Administration *Area Resource File: A Manpower Planning and Research Tool*, DHHS-HRA-80-4, Oct. 79. One time compilation.
- Annual Census of State and County Mental Hospitals. Resident patients and new admissions to mental institutions; costs, diagnoses of alcohol psychoses. DHHS-ADAMHA, National Institute of Mental Health (NIMH). *Mental Health Statistical Notes*, selected issues; special reports and tabulations furnished to the Center for Disease Control. Continuing reporting; National full count of patients in State and county mental hospitals.

NUTRITION

1. Nature and Extent of the Problem

Issues related to nutrition and food consumption involve complex interactions among social, cultural, economic and physiological factors. Adequate intakes of sources of energy and of essential nutrients are necessary for satisfactory rates of growth and development, physical activity, reproduction, lactation, recovery from illness and injury and maintenance of health through the life cycle. Deficits of essential nutrients or energy sources can lead to several specific diseases or disabilities and increased susceptibility to others. Excessive or inappropriate consumption of some nutrients may contribute to adverse conditions, such as obesity, or may increase the risk for certain diseases (e.g., heart disease, adult-onset diabetes, high blood pressure, dental caries and possibly some types of cancer). Such chronic diseases are clearly of complex etiology, with substantial variation in individual susceptibility to the factors involved. While the role of nutrients in these diseases is not definitively established, epidemiologic and laboratory studies offer important insights which may help people in making food choices so as to enhance their prospects of maintaining health. See High Blood Pressure, Physical Fitness and Exercise, and Fluoridation and Dental Health.

a. Health implications

- Obesity increases the risk for adult-onset diabetes and high blood pressure, both of which are associated with cardiovascular disease. Obesity also increases risk of gallbladder disease, degenerative joint diseases, and some types of cancer (e.g. endometrial cancer). (Obesity is defined in this discussion as significant overweight, i.e., 120 percent or more of "ideal" weight.)
- Frequent consumption of highly cariogenic foods (those containing fermentable, orally-retentive carbohydrates), especially between meals, can nullify some of the caries preventive benefits of adequate fluoride intake and/or can cause rampant caries in children with a fluoride deficiency.
- Inadequate nutrition may be one factor associated with poor pregnancy outcome, including some fraction of low birth weight infants, and suboptimum mental and physical development.
- Excessive sodium intake has been associated with high blood pressure in susceptible individuals.
- Total dietary fat, saturated fat and cholesterol may influence risk factors for heart disease.
- Eating more foods high in fiber may reduce the symptoms of chronic constipation, diverticulosis and some types of "irritable bowel" in some individuals.
- Dietary fat has been associated epidemiologically with some cancers, but better understanding of the strength of the relationship must await the outcome of ongoing studies.
- Breast fed infants appear to enjoy significant health advantages when compared with infants fed with breast milk substitutes, in particular, the immunologic characteristics of breast milk may increase resistance to infections and perhaps certain allergies.
- Poor nutrition may enhance susceptibility or impair host response to infections.
- See Misuse of Alcohol and Drugs, and Pregnancy and Infant Health.

b. Status and trends

- Over the 10 years from 1963 to 1973, mean body weight of American men and American women, ages 18 to 74, increased by an average of six pounds and three pounds, respectively. Height did not play an appreciable role in accounting for the increase.
- Iron and folic acid deficiencies are particularly common among pregnant or lactating women.
- Average blood cholesterol levels in the United State among men of all age groups declined slightly between surveys conducted in 1960–62 and 1971–74; among women, blood cholesterol levels declined as much as 7 percent in the age group 55 to 64, and 6 percent in the age group 65 to 74.
- Some subsets of the population are more prone to obesity than others:
  - — for people ages 20 to 74, about 14 percent of men and 24 percent of women meet the criterion for obesity (120 percent of "ideal");
  - — of men who are not poor, about 12 percent of blacks and 13 percent of whites ages 45 to 64 are obese;
  - — of men who are poor, only 4 percent of blacks and 5 percent of whites ages 45 to 64 are obese;

  - of women who are not poor, 40 percent of blacks and 29 percent of whites ages 45 to 64 are obese;
  - of women who are poor, 49 percent of blacks and 26 percent of whites ages 45 to 64 are obese.

- Prevalence of breast feeding declined from 65 percent in the late 1940s to 26 percent in 1969. In the past decade, prevalence of breastfeeding has increased to 45 percent of newborns, at least initially. In contrast to the past, however, women of lower socioeconomic status are now less likely to breastfeed than women of higher socioeconomic status.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - increasing awareness of ideal weight ranges and safe weight reduction and weight control strategies based on energy balance concepts;
  - increasing awareness of the science base regarding relationships between diet and heart disease, high blood pressure, certain cancers, diabetes, dental caries and other conditions;
  - providing information and behavioral skills to select and prepare more healthful diets;
  - developing more effective means of communicating nutrition information to people in different age and ethnic groups;
  - providing nutrition information and education about healthy food choices in the home (via the media), in schools, at the worksite, by and to health care providers, at the point of purchase, as a part of government food service programs (such as Project Head Start, school lunch and WIC Programs) and by appropriate advertising;
  - providing appropriate information on the advantages and techniques of breastfeeding and when appropriate, alternatives, particularly for low income women.
- Service measures include:
  - nutritious breakfast and lunch programs for school children and meals for senior citizens;
  - food stamps for low income populations;
  - food supplements for low income women, infants and children at risk for nutritional problems;
  - nutritious food offered in business and institutional settings;
  - counseling related to dietary practices routinely offered to high risk individuals through the health care system, schools and workplaces;
  - psychosocial support groups focused on weight control and weight maintenance;
  - counseling regarding the merits of breastfeeding and appropriate techniques.
- Technologic measures include:
  - ensuring nutritional quality and content of manufactured foodstuffs, from production through consumption;
  - changing livestock practices to produce leaner meat;
  - fortifying certain foodstuffs;
  - developing and making readily available new products lower in fat, saturated fat, cholesterol, sodium and sugars;
  - positioning products in supermarkets so that key information on caloric, cholesterol, sodium and sugar contents of products is readily apparent.
- Legislative and regulatory measures include:
  - promulgation of guidelines to maintain or improve the nutritional quality of the food supply;
  - requiring nutrition labeling on foods about which nutrition claims are made or to which nutrients are added, including information on calories, fat, carbohydrate, protein, cholesterol, sugars, sodium and other nutrients of public health concern;
  - providing explicit discretionary authority to regulate fortification of foods when it is of public health significance;
  - regulation of food vending practices in schools and health facilities to reduce or eliminate highly cariogenic foods and snacks;
  - grading standards to give greater emphasis to lower fat products;
  - regulating televised advertisements which promote cariogenic and non-nutritious foods and snacks and which are directed at young children.
- Economic measures include:
  - studying possibilities for adjusting insurance premiums, in relation to relative risk, for corporations offering employee health promotion programs with a nutrition component;
  - government food purchasing support practices;
  - assessing feasibility and cost benefits of reimbursement by third party payers of counseling services which meet appropriate standards;
  - reducing or eliminating local sales taxes on staple foods.

b. Relative strength of the measures

- Service programs are likely to be effective in improving the nutritional status of pregnant women and children and, perhaps in reducing the incidence of low birth weight infants.
- Certain segments of the public have responded to educational and informational messages about fats and cholesterol by reducing their intakes. On the other hand, some recent messages have been mixed and contradictory, leaving the public confused. The DHHS/USDA *Dietary Guidelines for Americans* provide a simple set of practical recommendations.
- Technologic measures hold real promise, particularly if governmental policies could be gen-

erated in support of such measures and if resultant products are acceptable to consumers.

- With the exception of food sanitation, regulation and economic incentives have not been employed and are, therefore, of uncertain potential.
- Education and counseling programs regarding breastfeeding have been successful in increasing the prevalence of breastfeeding among middle and upper income women. It is reasonable to expect similar results from programs targeting low income women.

3. Specific Objectives for 1990 or Earlier

- Improved health status
  - — Improvements in nutrition may yield reduced rates of infant mortality, cardiovascular disease, dental caries and possibly some cancers. Certain quantified health status objectives are specified in the sections on High Blood Pressure Control, Pregnancy and Infant Health, and Flouridation and Dental Health. Others are noted below. Still others (particularly those related to heart disease and cancer) are not stated, due to uncertainties in quantifying the exposure-to-disease relationship.

a. By 1990, the proportion of pregnant women with iron deficiency anemia (as estimated by hemoglobin concentrations early in pregnancy) should be reduced to 3.5 percent. (In 1978, the proportion was 7.7 percent.)

b. By 1990, growth retardation of infants and children caused by inadequate diets should have been eliminated in the United States as a public health problem. (In 1972–73, it was estimated that 10 to 15 percent of infants and children among migratory workers and certain poor rural populations suffered growth retardation due to diet inadequacies.)

- Reduced risk factors

*c. By 1990, the prevalence of significant overweight (120 percent of "desired" weight) among the U.S. adult population should be decreased to 10 percent of men and 17 percent of women, without nutritional impairment. (In 1971–74, 14 percent of adult men and 24 percent of women were more than 120 percent of "desired" weight.)

***NOTE:** Same objective as for High Blood Pressure Control.

d. By 1990, 50 percent of the overweight population should have adopted weight loss regimens, combining an appropriate balance of diet and physical activity. (Baseline data unavailable.)

e. By 1990, the mean serum cholesterol level in the adult population aged 18 to 74 should be at or below 200 mg/dl. (In 1971–74, for male and female adults aged 18 to 74, the mean serum cholesterol level was 223 mg/dl. For a smaller population sample in 1972–75, mean blood plasma cholesterol levels were about 211 mg/dl for males aged 40 to 59 and about 210 mg/dl for females aged 40 to 59.)

f. By 1990, the mean serum cholesterol level in children aged 1 to 14 should be at or below 150 mg/dl. (In 1971–74, for children aged 1 to 17, the mean serum cholesterol level was 176 mg/dl. For a smaller population sample in 1972–75, the mean blood plasma cholesterol level for children aged 10 to 14 was about 160 mg/dl.)

*g. By 1990, the average daily sodium ingestion (as measured by excretion) by adults should be reduced at least to the 3 to 6 gram range. (In 1979, estimates ranged between averages of 4 and 10 grams sodium. NOTE: One gram salt provides approximately .4 grams sodium.)

***NOTE:** Same objective as for High Blood Pressure Control.

h. By 1990, the proportion of women who breastfeed their babies at hospital discharge should be increased to 75 percent and 35 percent at six months of age. (In 1978, the proportion was 45 percent at hospital discharge and 21 percent at 6 months of age.)

- Increased public/professional awareness

i. By 1990, the proportion of the population which is able to identify the principal dietary factors known or strongly suspected to be related to disease, should exceed 75 percent for each of the following diseases: heart disease, high blood pressure, dental caries and cancer. (Baseline data largely unavailable. About 12 percent of adults are aware of the relationship between high blood pressure and sodium intake.)

j. By 1990, 70 percent of adults should be able to identify the major foods which are: low in fat content, low in sodium content, high in calories, good sources of fiber. (Baseline data unavailable.)

k. By 1990, 90 percent of adults should understand that to lose weight people must either consume foods that contain fewer calories or increase physical activity—or both. (Baseline data unavailable.)

- Improved services/protection

l. By 1990, the labels of all packaged foods should contain useful calorie and nutrient information to enable consumers to select diets that promote and protect good health. Similar information should be displayed where nonpackaged foods are obtained or purchased.

m. By 1990, sodium levels in processed food should be reduced by 20 percent from present levels. (Baseline data unavailable.)

n. By 1985, the proportion of employee and school cafeteria managers who are aware of, and actively promoting, USDA/DHHS dietary guidelines should be greater than 50 percent.

o. By 1990, all States should include nutrition education as part of required comprehensive school health education at elementary and secondary levels. (In 1979, only 10 States mandated nutrition as a core content area in school health education.)

p. By 1990, virtually all routine health contacts with health professionals should include some element of nutrition education and nutrition counseling. (Baseline data unavailable.)

- Improved surveillance/evaluation system

q. Before 1990, a comprehensive National nutrition status monitoring system should have the capability for detecting nutritional problems in special population groups, as well as for obtaining baseline data for decisions on National nutrition policies.

4. Principal Assumptions

- Efforts to promote the DHHS/USDA *Dietary Guidelines for Americans* will involve wide public and private sector participation and support.
- Governmental efforts in nutrition education will be continued and improved.
- Public and private efforts to make the population aware of the science base with respect to diet and chronic disease will be expanded, including those areas for which controversy exists.
- Current research efforts to improve the science base with respect to diet and disease will continue to grow, with improved dissemination of information.
- Research to identify effective measures of nutrition education will be productive.
- Current efforts to develop a National nutrition monitoring and surveillance system will be maintained.
- Programs to promote economic and physical access to high quality foods will be continued and improved.
- Cooperation between Government and the private health care sector will increase on nutrition related issues.
- Major food processors and distributors will incorporate nutrition principles and concepts into their food and marketing strategies and messages.
- Public and private sector efforts to maintain the wholesomeness of the food supply will continue.
- Better methods to monitor the population's knowledge and understanding of nutrition will be developed.
- Nutrition messages aired over television and radio will continue, and will be more explicit as to healthful diets.
- Comprehensive school health education, including nutrition education, will become a more integral part of the K–12 curriculum.
- Health professionals will play a larger role in the provision of nutrition information.
- A set of principles of human nutrition will be defined and used as a basis for public policy decisions.

5. Data Sources

a. To National level only

- Health and Nutrition Examination Survey (HANES). Height, weight, skinfold thickness; serum cholesterol values and breast feeding. DHHS-National Center for Health Statistics (NCHS). HANES I, 1971–1974; HANES II, 1979. NCHS *Vital and Health Statistics*, Series 11. Periodic surveys; data obtained from physical examinations, National probability sample.
- Health Interview Survey (HIS). Food practices, food habits, based on data collected in a continuing nationwide survey through personal household interviews. DHHS-NCHS. *Vital and Health Statistics*, Series 10. Continuing survey; household interview, National probability sample.
- Lipid Research Clinics. Prevalence of dyslipidemias in defined populations, *and* cholesterol levels in hypercholesterolemic men and women between 35–59 years. DHHS-National Heart, Lung, and Blood Institute (NHLBI). Continuous reporting from 10 international clinics.
- Hypertension Detection and Follow Up Program. Nutrition related risk factors among persons at high risk of coronary and vascular diseases. DHHS-NHLBI. NHLBI-(NIH) *Hypertension Task Force Reports*, Numbers 8 and 9. One time survey.
- Multiple Risk Factor Intervention Trial (MRFIT). Testing whether nutrition and other risk reduction interventions in men 35–54 years of age who are above average risk of death from coronary disease, can yield significant reduction in mortality from coronary heart disease. DHHS-NHLBI. Reports due 1983.
- Marketing Research Survey. Prevalence and trends of breastfeeding at one week of age. Marketing Research Department, Ross Laboratory, Columbus, Ohio. Reported in *Pediatrics*, November 1979. Continuing survey; representative sample of short stay hospitals; recall response of mothers after six months.
- Nationwide Food Consumption Survey (NFCS). Food intake of individuals and households. *National Food Consumption Survey Report.* USDA-Consumer and Food Economics Institute, Human Nutrition Center (HNC). Collected nationally about every 10 years since 1935. National survey of sample of households.
- National Survey of Family Growth (NSFG). Prevalence of breastfeeding. DHHS-NCHS, *Vital and Health Statistics*, Series 23, selected reports. Interview survey of 10,000 women in National probability sample representing American women 15–44 years of age.
- Nutrient Composition Data. Tabular analysis of nutrient composition of specific food products. USDA-Consumer and Food Economics Insti-

tute. Agriculture Handbook Number 8: *Composition of Foods—Raw, Processed and Prepared*. Continuous reporting.

- Food Labeling. Use of nutrition labeling; nutrition content; impact of numerous regulatory actions related to nutrition labeling. DHHS-Food and Drug Administration (FDA). Continuing surveys.
- Consumer Price Index (CPI). Price changes across Nation for a fixed market basket of foods and services. Department of Labor-Bureau of Labor Statistics (BLS). Monthly CPI Reports. Continuing survey; National sample.
- Nutrition surveillance report. Selected indices of nutritional status from ten selected States, health department clinics, WIC screening, and Head Start Programs. CDC *Nutrition Surveillance Reports*. DHHS-Center for Disease Control (CDC). Continuous reporting from selected sources.
- National Menu Census. Tabulation of about 460 food items sold away from home as to "good," "slow," or "never sell," including demographic data. *Institutions Magazine*. Chicago, Illinois. Reporting annually in April 1st issue of *Institutions*. Continuing survey; National sample of eating establishments.
- Nutritional Status Monitoring System (NSMS). Comprehensive National nutrition status monitoring system to be developed and implemented jointly by DHHS and USDA. A coordinated system drawing on health and other vital statistics from DHHS, and food use and consumption data from USDA and DHHS. DHHS-Office of the Assistant Secretary for Health (OASH), Nutrition Coordinating Office.

b. To State and/or local level

- National Vital Registration System
  - — Mortality. Deaths by cause (including fetal and infant mortality), by age, sex, and race. DHHS-NCHS. NCHS *Vital Statistics of the United States*, Vol. II, and NCHS *Monthly Vital Statistics Reports*. Continuing reporting from States; National full count. (Many States issue earlier reports.)
  - — Natality. Births and birth rates by place of occurrence and by the mother's place of residence, age, race and parities. DHHS-NCHS. NCHS *Vital and Health Statistics*, Series 21, selected reports, and *Monthly Vital Statistics Report*. Birth data obtained from certificates of live births to U.S. residents filed throughout the United States. Birth rates calculated on the basis of the number of women 14–49 years of age residing in the respective areas enumerated in census years, and estimated for inter-census years.
- National Morbidity and Mortality Reporting System. Numbers of 46 reportable diseases (including foodborne outbreaks) deaths in 121 U.S. cities. DHHS-CDC. CDC *Morbidity and Mortality Weekly Report*, and annual reports. Morbidity: continuous reporting from State health departments on basis of physician reports. (Completeness of reporting varies greatly, since not all cases receive medical care and not all treated conditions are reported.) Mortality: continuous reporting; volunteer panel of health departments in 121 U.S. cities, full count.
- Selected health data. DHHS-NCHS. NCHS *Statistical Notes for Health Planners*. Compilations and analysis of data to State level.
- Area Resource File (ARF). Demographic, health facility and manpower data at State and county level from various sources. DHHS-Health Resources Administration. *Area Resource File: A Manpower Planning and Research Tool*, DHHS–HRA–80–4, Oct 79. One time compilation.

PHYSICAL FITNESS AND EXERCISE

1. Nature and Extent of the Problem

The health benefits associated with regular physical fitness and exercise have not yet been fully defined. Based on what is now known it appears that substantial physical and emotional benefits, direct and indirect, are possible. Yet most Americans do not engage in appropriate physical activity, either during recreation or in the course of their work. For the purposes of this discussion, "appropriate physical activity" refers to exercise which involves large muscle groups in dynamic movement for periods of 20 minutes or longer, three or more days per week, and which is performed at an intensity requiring 60 percent or greater of an individual's cardiorespiratory capacity. Exercise to improve flexibility and muscular strength may reduce the frequency of musculoskeletal problems and is an important supplement to cardiovascular conditioning activities.

a. Health implications

- Most people feel better when they exercise.
- Physical inactivity can result in decreased physical working capacity at all ages, with concomitant decreases in physiologic function and health status.
- Physical inactivity is associated with an increased risk of developing obesity and its disease correlates.
- Physical inactivity is associated with increased risk of coronary heart disease.
- Appropriate physical activity may be a valuable tool in therapeutic regimens for control and amelioration (rehabilitation) of obesity, coronary heart disease, hypertension, diabetes, musculoskeletal problems, respiratory diseases, stress and depression/anxiety. Such physical activity, however, is still not routinely prescribed for the treatment of these conditions.

b. Status and trends

- Though physical fitness and exercise activities have increased in recent years—and over 50 percent of adults reported regular exercise in popular opinion polls—generous estimates place the proportions of regularly exercising adults ages 18 to 65 at something over 35 percent.
- Regular runners include approximately 5 percent of all Americans over age 20, and 10 percent of men aged 20 to 44.
- About 36 percent of adults ages 65 and older were estimated in 1975 to take regular walks.
- Only about a third of children and adolescents ages 10 to 17 are estimated to participate in daily school physical education programs, and the share is declining.
- Many high school programs focus on competitive sports that involve a relatively small proportion of students.
- Though growing, the awareness of the health benefits of regular exercise is limited.
- Only a small proportion (about 2.5 percent) of companies and institutions with greater than 500 employees offer fitness programs for their workers.
- Certain groups demonstrate disproportionately low rates of participation in appropriate physical activity, including girls and women, older people, physically and mentally handicapped people of all ages, inner city and rural residents, people of low socioeconomic status and residents of institutions.

2. Prevention/Promotion Measures

a. Potential measures

- Education and information measures include:
  - using television and radio public service announcements to provide information on appropriate physical activity and its benefits;
  - providing information in school and college-based programs;
  - providing information in health care delivery systems, including incorporation of queries about exercise habits into the routine clinical history;
  - encouraging health care providers, especially in HMOs, community health centers and other organized settings, to prescribe appropriate exercise in weight loss regimens as a complementary treatment modality in the management of several chronic diseases, and to give patients 65 years and older and the handicapped more detailed information on appropriate physical activity together with warnings about starting up exercise too fast;
  - adopting an exercise component by community service agencies (such as the American Red Cross, the American Heart Association);

- — assuring that all programs and materials related to diet and weight loss have an active exercise component;
- — tailoring education programs to the needs and characteristics of specific populations.

- Service measures include:
  - — providing physical fitness and exercise programs to school children, and ensuring that those programs emphasize activities for all children rather than just competitive sports for relatively few;
  - — providing physical fitness and exercise programs in colleges;
  - — providing worksite-based fitness programs which are linked to other health enhancement components (e.g., smoking cessation, nutrition improvement) and which have an active outreach effort;
  - — incorporating exercise and fitness protocols as regular clinical tools of health providers.
- Technologic measures include:
  - — increasing the availability of existing facilities and promoting the development of new facilities by public, private and corporate entities (e.g., fitness trails, bike paths, parks, pools);
  - — upgrading existing facilities, especially in inner city neighborhoods, and involving the population to be served at all levels of planning.
- Legislative and regulatory measures include:
  - — city council support for bicycle and walking paths for use in trips to work and school;
  - — developing and operating local, State and National park facilities which can be used for physical fitness activities in urban areas;
  - — increasing the number of school-mandated physical education programs that focus on health-related physical fitness;
  - — establishing State and local councils on health promotion and physical fitness;
  - — allowing expenditure of funds for fitness-related activities under Federally funded programs guided by Federal regulations.
- Economic measures include:
  - — tax incentives for the private sector to offer physical fitness programs for employees;
  - — encouraging employers to permit employees to exercise on company time and/or giving employees flexible time for use of facilities;
  - — offering health and life insurance policies with reduced premiums for those who participate in regular vigorous physical activity.

b. Relative strength of the measures

- Programs which are most likely to be successful in recruiting new participants to appropriate physical activity include those which offer services and facilities to individuals, and economic incentives to groups and individuals.
- On the other hand, programs which can more easily be implemented include those related to the provision of public information and education and improving the linkages with other health promotion efforts.
- The effectiveness of all measures is handicapped by the limitation in knowledge with respect to:
  - — the relation between exercise and physical and emotional health;
  - — the optimum types of exercises for various groups of people with special needs;
  - — the appropriate way to measure levels of physical fitness for various age groups.

3. Specific Objectives for 1990

- Improved health status
  - — Increased levels of physical fitness may contribute to reduced heart and lung disease rates, possibly reduced injuries among the elderly, and, more broadly, an enhanced sense of well-being which may reinforce positive health behaviors in other areas. Currently, however, few quantifiable health status objectives for physical fitness and exercise can be developed.
- Reduced risk factors

a. By 1990, the proportion of children and adolescents ages 10 to 17 participating regularly in appropriate physical activities, particularly cardiorespiratory fitness programs which can be carried into adulthood, should be greater than 90 percent. (Baseline data unavailable.)

b. By 1990, the proportion of children and adolescents ages 10 to 17 participating in daily school physical education programs should be greater than 60 percent. (In 1974–75, the share was 33 percent.)

c. By 1990, the proportion of adults 18 to 65 participating regularly in vigorous physical exercise should be greater than 60 percent. (In 1978, the proportion who regularly exercise was estimated at over 35 percent.)

d. By 1990, 50 percent of adults 65 years and older should be engaging in appropriate physical activity, e.g., regular walking, swimming or other aerobic activity. (In 1975, about 36 percent took regular walks.)

- Increased public/professional awareness

e. By 1990, the proportion of adults who can accurately identify the variety and duration of exercise thought to promote most effectively cardiovascular fitness should be greater than 70 percent. (Baseline data unavailable.)

f. By 1990, the proportion of primary care physicians who include a careful exercise history as part of their initial examination of new patients should be greater than 50 percent. (Baseline data unavailable.)

- Improved services/protection
  - g. By 1990, the proportion of employees of companies and institutions with more than 500 employees offering employer-sponsored fitness programs should be greater than 25 percent. (In 1979, about 2.5 percent of companies had formally organized fitness programs.)
- Improved surveillance/evaluation systems
  - h. By 1990, a methodology for systematically assessing the physical fitness of children should be established, with at least 70 percent of children and adolescents ages 10 to 17 participating in such an assessment.
  - i. By 1990, data should be available with which to evaluate the short and long-term health effects of participation in programs of appropriate physical activity.
  - j. By 1990, data should be available to evaluate the effects of participation in programs of physical fitness on job performance and health care costs.
  - k. By 1990, data should be available for regular monitoring of National trends and patterns of participation in physical activity, including participation in public recreation programs in community facilities.

4. Principal Assumptions

- Increased physical activity by the American public will result in overall improvements in health.
- Personal commitment to enhance health will become a prominent factor promoting increased participation in exercise activities in the United States.
- Voluntary agencies, private corporations and government will expand their commitment to physical fitness programs.
- Private industry and retailers will support activities promoting physical fitness, which will also promote increased sales of their products.
- Environmental, cultural and behavioral differences influence attitudes toward, and participation in, regular exercise.
- Inner city residents will continue to have fewer adequate facilities and appropriate activity programs.
- Special attention will be required to make gains in participation among lower socioeconomic groups.
- There will be a reversal of the trend in reductions of school-based programs aimed at promoting physical fitness. However, these programs will not necessarily be founded in the traditional physical education mold.
- New school-based programs will embrace activities which expand beyond competitive sports.
- The increasing costs associated with health care will compel public policy to emphasize measures such as physical fitness to enhance health.
- Reduced levels of physical fitness in the work force may result in increased absenteeism from acute illness and, accordingly, decreased productivity. Thus, employers have incentives for offering physical fitness programs to their employees.

5. Data Sources

a. To National level only

- Health Interview Survey (HIS). Extent of regular exercise; job related physical activity; regular participation in exercise DHHS-National Center for Health Statistics (NCHS). NCHS *Vital and Health Statistics*, Series 10, selected reports, and *Advance Data from Vital and Health Statistics*, No. 78–1250. Continuing survey; National probability sample.
- Extent of regular exercise. (Non-work related only.) Regular participation in exercise reported in household survey, and self-reported change over previous year. Survey for General Mills, conducted by Yankelovich, Skelly and White. *Family Health in an Era of Stress.* General Mills, Inc., 9200 Wayzata Boulevard, Minneapolis, Minnesota, 1979. One time survey; National probability sample.
- Extent of regular exercise. (Non-work related only.) Survey for Pacific Mutual Life Insurance Company, conducted by Louis Harris and Associates, Inc. *Health Maintenance,* 1978. Pacific Mutual Life Insurance, Newport Beach, California.
- Public attitudes regarding physical fitness. Attitudes, knowledge and behavior regarding physical fitness and exercise. Survey for Great Waters of France, conducted by Louis Harris and Associates, Inc. *The Perrier Study; Fitness in America,* 1979. One time survey; representative sample and special sample of runners.

b. To State and/or local level

- Exercise programs in schools. Student enrollment in physical fitness activities; program content and scheduling. Councils on Physical Fitness, selected States only.
- Student physical fitness levels. Councils on Physical Fitness, selected States only.

CONTROL OF STRESS AND VIOLENT BEHAVIOR

1. Nature and Extent of the Problem

Some stress may be beneficial. On the other hand, stressful conditions can result in substantial dysfunction. Public perception of the role of stress as a contributor to major illness and diminished quality of life focused considerable attention upon the need to provide practical and ethical means of favorably influencing this pervasive condition of 20th century life. As used here, the term stress refers to those pressures and tensions (whether behaviorally, biologically, economically or environmentally induced) which, unless suitably managed, can lead to psychological or physiological maladaptations manifested in phenomena such as fatigue, headache, obesity, absenteeism, illness, accident-proneness or violence.

Because the socioeconomic impact of contemporary psychosocial stress and its biologic devastation is probably enormous, comprehensive public health programs aimed at stress management are of high priority. However, it would be unwise to mount extensive programs on the basis of beliefs rather than evidence. The major responsibility and challenge for a stress management strategy is to find the means to identify individuals or groups especially vulnerable to stress, to provide health professionals and the public with whatever accurate information exists on stress identification and management and, when the answers are not known, to formulate the questions that will offer the best chance for obtaining rational answers.

Violent behavior—in its many forms—exacts a huge toll on America's physical and mental health. Suicide and homicide lead to thousands of premature deaths annually. Assault, including rape and child and spouse abuse cause much injury and emotional suffering. Numerous factors underlie these violent forms of behavior. Health programs alone cannot deal with these factors. Many major aspects of American social structure are involved—the family, the community, the system of stratification, the educational system and the economic structure. Much remains unknown regarding means of reducing mortality associated with violent behavior. Even in the absence of such information important steps can be taken.

a. Health implications

- Evidence linking psychosocial and behavioral factors to major health disorders seems persuasive enough to justify the conclusion that stress is importantly involved. However, there is a clear need to study and evaluate the interaction of psychological, environmental and biological factors in laboratory, clinical, industrial and school settings.
- There is much evidence that many causes of stress (situational external demands, challenging life events) have clearly measurable physiologic and psychological effects.
- Usually, however, reactions or responses to stress are short-term; homeostasis is restored through various coping mechanisms without perceptible damage.
- Much remains to be elucidated about the variability of people's vulnerability to stress, including their developmental histories, their psychological defenses and coping capabilities. While most people face life's stresses with appropriate resistances, a minority do not. For these highly susceptible groups and individuals, stress intervention programs would be desirable.
- Whether stress becomes a problem for any given individual depends on a combination of factors, unique to that person, that may bolster resistance and/or resilience. Also, any individual's perception of stress and reaction to it may vary with time, circumstance and environmental factors.
- Some groups in the population appear to be particularly vulnerable to stress overload (adolescents, the elderly, the unemployed, workers in certain occupations, people who experience major disruptions in their lives such as death of a spouse or job change).
- Stress may function as a precipitator of dysfunction or illness, as a predisposing factor or as a sustaining factor in chronic conditions, or as a precipitator of violent behavior.
- Evidence on the disease effects of stress is strongest for depression, coronary heart disease, peptic ulcer, asthma and diabetes.
- Evidence is also available regarding the relationship of stress to mental health problems, substance abuse, accidents, lower back pain, terminal renal failure, skin rashes, tuberculosis, multiple sclerosis, cancer and childhood streptococcal infections.
- Unmanaged stress plays a major role in suicides and homicides which are leading causes of death among youth in the 15 to 24 age group.

- Stress is also related to family violence, including child abuse.
- A possible major mechanism for the relationship of stressful life events on certain disease states is through suppression of the normal immune response of the organism. However, precise knowledge of the mechanisms relating stress to psychological and physical dysfunction is not clearly identified.

b. Status and trends

- In one recent National survey, 82 percent of those polled indicated that they "need less stress in their lives."
- In 1978 there were 5,100 deaths from suicide among people ages 15 to 24.
- In recent years suicide has ranked as the ninth leading cause of death for all age groups. It ranks as the second leading cause of death among youths 15 to 24. Increasingly it is also an important cause of death among the aged.
- It is estimated that 200,000 to 4 million cases of child abuse occur each year and that 2,000 children die each year in circumstances suggesting abuse or neglect.
- Hundreds of thousands of cases of violent (but non-fatal) assault occur each year. These include instances of spouse abuse and rape.
- The death rate from homicide among black males ages 15 to 24 increased from 46.4 per 100,000 population in 1960 to 72.5 in 1978.
- Minority groups have a greater risk of death from homicide than whites. An estimated 60 to 80 percent of homicides occur as the result of personal disagreements and conflicts. Firearms were used in 63 percent of murders occurring in 1977, with handguns used in half.
- There are few (if any) definitive measures identified of the prevalence of harmful stress.
- There is increasing public awareness that stress may be harmful.
- The public has limited accurate knowledge and information about what can be done to control (reduce) stress. This leads to simplistic perceptions and techniques which may be harmful and/or impede successful long-term management.

2. Prevention/Promotion Measures

Programs of any nature directed at stress management must first relate to the individual perception, motivation, evaluation and response to the stress. A sense of well-being and good stress management usually accompany some combination of the following life circumstances: job satisfaction; people who provide affection and mutual assistance; adequate income; sense of belonging to a social group; time for self; physical fitness; adequate sleep; and freedom from disease.

Certain approaches seem prudent for the management of stress:

— individually focused efforts (exercise, relaxation techniques, adequate sleep, general "self-care", improved psychological coping mechanisms);

— social group focused efforts (mutual aid, self-help support groups);

— societally or institutionally focused efforts to change unsatisfactory environmental conditions such as overcrowded housing, pollution, stressful working conditions; to modify social norms or values such as in relation to smoking and drinking; and to inform the public regarding the role of stress.

A major aim is to enhance dignity, and thus to provide the will to strive for self-management and self-mastery.

It appears that violent behavior, while occurring in all strata of American society, exacts a far greater toll among minority and other economically deprived groups in the United States. Thus many measures which would improve the economic and social position of these groups might well be accompanied by a reduction of rates of homicide.

a. Potential measures

- Education and information measures include:
  - — increasing the public's awareness, through planned campaigns utilizing the appropriate media, that stress can be an antecedent of illness and that stress management can be an important component of health;
  - — creating new educational pathways for developing enhanced professional skills in bio-behavioral fields of medicine and public health;
  - — developing the capacities of health care professionals in stress diagnosis and management;
  - — helping parents recognize and deal with stress;
  - — training secondary, elementary and pre-school teachers to include discussion of stress recognition and management in school health curricula;
  - — training of police in handling calls involving domestic and interpersonal disputes which would potentially lead to violent behavior;
  - — public education, especially for high risk groups, on steps to take to reduce risks of rape;
  - — training all "helping" professionals regarding signs which indicate high risk for suicide;
  - — helping the public be aware of indicators of possible suicide.
  - — See Pregnancy and Infant Health.
- Service measures include:
  - — hotlines for people under acute stress (suicide, child abuse prevention);

- stress management programs in work places;
- stress management programs targeted to adolescents, parents and the elderly;
- stress appraisal analysis (self-administered or performed by a legitimate objective outside source);
- professional and social support systems to assist in resolution of stressful life events, including mutual aid and self-help groups such as Reach for Recovery, child abusing parents, bereavement groups, single parent groups;
- information and counseling with regard to individually appropriate leisure and stress-reducing activities including exercise;
- a variety of self-help relaxation and biofeedback techniques, which can be individualized in concert with a diversity of lifestyles and work requirements;
- psycho-physiologic tests to aid in assisting employees who are having difficulty adjusting to their work and to their co-workers;
- support services for inevitable or necessary life change events—especially in relation to death, separation, job changes and geographic relocation;
- domestic crisis teams to defuse domestic disputes;
- targeting the above measures to high risk populations and individuals with low coping abilities;
- evaluating intervention efforts;
- follow-up services for persons who have attempted suicide;
- shelters for abused wives (and husbands);
- training all health (and other human services—including educational) personnel to be alert to evidence of child abuse.

- Technologic measures include:
  - actions by employers, labor and government to reduce stress-creating work environments;
  - reducing stressful aspects of the environment such as noise pollution and overcrowding.

- Legislative and regulatory measures include:
  - activities to create employment opportunities for youth;
  - action to limit the availability of handguns, to reduce homicides and suicides that occur during stressful periods;
  - strengthening mandatory child abuse reporting laws.

b. Relative strength of the measure

- The relative strength of potential stress intervention efforts (measures) is not yet known.
- Stress reduction and management often require behavioral changes, but most physicians and other health professionals are not trained in assisting their patients to modify their lifestyles or behavior.
- Many stress prevention measures call for extensive modifications in public attitudes and complex cultural reappraisals at all levels, public and private. These cannot be expected to take place quickly.
- At a minimum, vigorous efforts at early detection and assistance will be necessary at common sites where this is possible—i.e., schools and worksite.
- Little is known about the relative strength of potential efforts to reduce rates of violent behavior. There is some evidence that suicide prevention and rape prevention efforts do have an impact—at least with certain populations.

3. Specific Objectives for 1990 or Earlier

- Improved health status
  a. By 1990, the death rate from homicide among black males ages 15 to 24 should be reduced to below 60 per 100,000. (In 1978, the homicide rate for this group was 72.5 per 100,000.)
  b. By 1990, injuries and deaths to children inflicted by abusing parents should be reduced by at least 25 percent. (Reliable baseline data unavailable—estimates vary from 200,000 to 4 million cases of child abuse occurring each year in this country.)
  c. By 1990, the rate of suicide among people 15 to 24 should be below 11 per 100,000. (In 1978, the suicide rate for this age group was 12.4 per 100,000).

- Reduced risk factors
  - Certain risk factors for stress are well-identified. Some have been addressed in the sections on Family Planning (unintended pregnancies), Occupational Safety and Health, Misuse of Alcohol and Drugs, and Physical Fitness and Exercise. Other risk factors for stress such as those imbedded in family history and major life changes, are not easily controlled or quantified and therefore are not specified as measurable objectives.

  d. By 1990, the number of handguns in private ownership should have declined by 25 percent. (In 1978, the total number of handguns in private ownership was estimated to be 30 to 40 million.)

- Increased public/professional awareness
  e. By 1990, the proportion of the population over the age of 15 which can identify an appropriate community agency to assist in coping with a stressful situation should be greater than 50 percent. (Baseline data unavailable.)
  f. By 1990, the proportion of young people ages 15 to 24 who can identify an accessible suicide prevention "hotline" should be greater than 60 percent. (Baseline data unavailable.)

g. By 1990, the proportion of the primary care physicians who take a careful history related to personal stress and psychological coping skills should be greater than 60 percent. (Baseline data unavailable.)

- Improved services/protection

h. By 1990, to reduce the gap in mental health services, the number of persons reached by mutual support or self-help groups should double from 1978 baseline figures. (In 1978, estimates ranged from 2.5 to 5 million; depending on the definition of such groups.)

i. By 1990, stress identification and control should become integral components of the continuum of health services offered by organized health programs. (Baseline data unavailable.)

j. By 1990, of the 500 largest U.S. firms, the proportion offering work-based stress reduction programs should be greater than 30 percent. (Baseline data unavailable.)

- Improved surveillance/evaluation systems

k. By 1985, surveys should show what percentage of the U.S. population perceives stress as adversely affecting their health, and what proportion of these are trying to use appropriate stress control techniques.

l. By 1985, a methodology should have been developed to rate the major categories of occupation in terms of their environmental stress loads.

m. By 1990, the existing knowledge base through scientific inquiry about stress effects and stress management should be greatly enlarged.

n. By 1990, the reliability of data on the incidence and prevalence of child abuse and other forms of family violence should be greatly increased.

4. Principal Assumptions

- Much of stress and stress-related illness is the result of fundamental socioeconomic status over which the health system has limited control.
- Further research will establish the relationship of stress to illness.
- Research will identify and demonstrate effective stress-control measures.
- The role of physical fitness and nutrition in successfully managing stress will be better understood.
- Various health care systems will be willing to assist patients in making the changes in their lifestyles that may be necessary to reduce stress and to improve coping with stress.
- Health professionals, health organizations, industry and labor will devote increased attention to understanding the relation of stress to illness and to violent behavior, as well as to better methods of stress reduction and management.
- Medical and nursing schools will offer instruction targeted at understanding the pathophysiology of stress and its management; training of other health professionals will also include stress education, as will continuing education programs for all health professionals.
- Hotlines and community support groups will prove effective in aiding individual efforts to cope with personal crises.
- Actions at the individual and community levels will foster measures to reduce the availability of handguns.
- Actions will be taken at the Federal, State, and local levels to increase the employment opportunities for youth.

5. Data Sources

a. To National level only

- National Vital Registration System—Mortality. Deaths by cause (including homicides and suicides), by age, race, and sex. DHHS-NCHS. NCHS *Vital Statistics of the United States*, Volume II, and NCHS *Monthly Vital Statistics Reports*. Continuing reporting from States; full National count. (Many States issue earlier reports).
- Public attitudes regarding stress. Perceptions of how problems of everyday life relate to health and mental health. Survey for General Mills, conducted by Yankelovich, Skelly and White, Inc. *Family Health in an Era of Stress*. General Mills, Inc., 9200 Wayzata Boulevard, Minneapolis, Minnesota. One time survey; National probability sample.

b. To State and/or local level

- No data sources unless questions on State or local household interview surveys.

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PARTICIPATING AGENCIES

Public Health Service (HHS)

Alcohol, Drug Abuse, and Mental Health Administration
Gerald L. Klerman, M.D., Administrator

Center for Disease Control
William H. Foege, M.D., Director

Food and Drug Administration
Jere Goyan, Ph.D., Commissioner

Health Resources Administration
Henry A. Foley, Ph.D., Administrator

Health Services Administration
George I. Lythcott, M.D., Administrator

National Institutes of Health
Donald S. Fredrickson, M.D., Director

Office of Adolescent Pregnancy Programs
Lula Mae Nix, Ed.D., Director

Office of Dental Affairs
John C. Greene, D.M.D., Chief Dental Officer

Office of Disease Prevention and Health Promotion
J. Michael McGinnis, M.D., Deputy Assistant Secretary for Health

Office of Environmental Affairs
James F. Dickson, III, M.D., Senior Advisor

Office of Health Maintenance Organizations
Howard Viet, Director

Office of Health Planning and Evaluation
Susanne Stoiber, Deputy Assistant Secretary for Health

Office of Health Research, Statistics, and Technology
Ruth S. Hanft, Deputy Assistant Secretary for Health

National Center for Health Services Research
Gerald Rosenthal, Ph.D., Director

National Center for Health Statistics
Dorothy P. Rice, Director

Office of Intergovernmental Affairs
Alonzo S. Yerby, M.D., Deputy Assistant Secretary for Health

Office of International Health
John H. Bryant, M.D., Deputy Assistant Secretary for Health

Office of Population Affairs
Ernest Peterson, Acting Deputy Assistant Secretary for Health

Office of Public Affairs
Mort Lebow, Director

Office on Smoking and Health
John M. Pinney, Director

Health Care Planning Administration (HHS)
Howard Newman, Administrator

Office of Human Development Services (HHS)
Cesar A. Perales, Assistant Secretary for Human Development Services

Social Security Administration (HHS)
William J. Driver, Commissioner

Department of Agriculture
Carol Tucker Foreman, Assistant Secretary for Food and Consumer Services

Consumer Product Safety Commission
Susan B. King, Chairman

Department of Defense
John H. Moxley, III, M.D., Assistant Secretary for Health Affairs

Department of Education
Floretta D. McKenzie, Acting Deputy Assistant Secretary, Office of School Improvement

Environmental Protection Agency
Douglas M. Costle, Administrator

Federal Trade Commission
Michael Pertschuk, Chairman

Department of Housing and Urban Development
Father Geno Baroni, Assistant Secretary for Neighborhoods, Voluntary Associations and Consumer Protection

Department of the Interior
Margaret G. Maguire, Deputy Director, Heritage, Conservation, and Recreation Service

Department of Labor
Eula Bingham, Ph.D., Assistant Secretary for Occupational Safety and Health

Department of Transportation
Joan Claybrook, Administrator, National Highway Traffic Safety Administration

Department of the Treasury
Richard J. Davis, Assistant Secretary for Enforcement and Operations

The following individuals participated in various stages of the development of the document. Chairpersons and Recorders of the 15 Work Groups of the 1979 Atlanta Conference are noted with an asterisk.

Herbert K. Abrams, M.D., M.P.H.
Health Sciences Center
The University of Arizona

Michael Adams, M.D.
Office of Program Planning and Evaluation
Center for Disease Control

Chung-Hae Ahn
Office of International Health
Office of the Assistant Secretary for Health

E. H. Ahrens, Jr., M.D.
The Rockefeller University

David T. Allen, M.D.
Department of Public Health
State of Tennessee

Archie E. Allen
Domestic Operations Office
ACTION

*Myron Allukian, D.D.S., M.P.H.
Bureau of Community Dental Programs
City of Boston

Ronald Altman, M.D.
New Jersey Department of Health

George R. Anderson, M.D.
Bureau of State Health Planning and Resource Development
Texas Department of Health

Linda Andreasen
Division of Health
Nevada Department of Human Resources

*Nicholas A. Ashford, Ph.D., J.D.
Center for Policy Alternatives
Massachusetts Institute of Technology

Dean A. Austin, Ph.D.
Lincoln Public Schools
Lincoln, Nebraska

Karen J. Axnick, R.N.
Department of Infection Control
Stanford University Hospital

Matilda A. Babbitz
School of Public Health
University of South Carolina

John Bagrosky
Office of Smoking and Health
U.S. Public Health Service

Lillian Bajda
Department of Health
State of New Jersey

Ned E. Baker, M.P.H.
Health Planning Association of Northwest Ohio

Susan Sorem Baker
Office of Health Planning and Evaluation
U.S. Public Health Service

Wendy Baldwin, Ph.D.
National Institute of Child Health and Human Development
National Institutes of Health

Linda Balog
School of Public Health
University of South Carolina

Albert Balows, Ph.D.
Bureau of Laboratories
Center for Disease Control

Diane Barhyte
American Public Health Association

Kathryn E. Barnard, R.N., Ph.D.
University of Washington
Seattle, Washington

Carolyn Barnes
Bureau of Training
Center for Disease Control

*Helen B. Barnes, M.D.
Department of Obstetrics and Gynecology
University of Mississippi Medical Center

*Patricia Z. Barry, Dr.P.H.
Department of Health Administration
University of North Carolina

James R. Beall, Ph.D.
U.S. Department of Labor

Lynn Beasley
Palmetto-Lowcountry Health Systems Agency, Inc.
Summerville, South Carolina

Dan E. Beauchamp, Ph.D.
School of Public Health
University of North Carolina

Ruth A. Behrens
Center for Health Promotion
American Hospital Association

Selina Bendix, Ph.D.
Department of City Planning
City and County of San Francisco

Ira Bernstein
College of Medicine
University of Vermont

Donald A. Berreth
Office of Information
Center for Disease Control

Fay R. Biles, Ph.D.
Department of Health and Safety Education
Kent State University

*Henry Blackburn, M.D.
School of Public Health
University of Minnesota

Chris Bladen
Office of the Assistant Secretary for Planning and
Evluation
Department of Health and Human Services

*Howard T. Blane, Ph.D.
University of Pittsburgh

Ronald G. Blankenbaker, M.D.
Indiana State Board of Health

Nick Blaskovich, Jr., Ph.D.
National Institute for Occupational Safety and Health
Center for Disease Control

*William L. Blockstein, Ph.D.
University of Wisconsin

Joseph H. Blount
Bureau of State Services
Center for Disease Control

*William B. Bock, D.D.S.
Bureau of State Services
Center for Disease Control

F. James Boehm, M.P.H.
Department of Human Resources
State of North Carolina

*Sue Bogner, Ph.D.
Health Services Administration

Frank P. Bolden
D.C. Public Schools
Washington, D.C.

*Richard J. Bonnie, L.L.B.
School of Law
University of Virginia

Joyce Borgmeyer, R.D.
Iowa State Department of Health

Gilbert J. Botvin, Ph.D.
American Health Foundation

Susan Boucher
Division of Cancer Prevention
Baltimore City Health Department

Frank Bowyer, D.D.S.
American Dental Association

Philip S. Brachman, M.D.
Bureau of Epidemiology
Center for Disease Control

Robert C. Bradbury, Ph.D.
Central Massachusetts Health Systems Agency
Shrewsbury, Massachusetts

Windell R. Bradford
Bureau of State Services
Center for Disease Control

Allen G. Brailey, Jr., M.D.
Personnel Department
Burlington Northern

*Elaine Bratic
National Cancer Institute
National Institutes of Health

Tameron E. Brink, R.D., M.P.H.
Division of Health
Nevada Department of Human Resources

Seiko Baba Brodbeck
American Public Health Association
Washington, D.C.

Edward M. Brooks
Office of Toxic Substances
Environmental Protection Agency

Wayne G. Brown
Bureau of Training
Center for Disease Control

Audrey K. Brown, M.D.
Downstate Medical Center
Brooklyn, New York

Sara Brown, Ph.D.
Select Panel on the Promotion of Child Health

Helen B. Brown, Ph.D.
Cleveland Clinic
Cleveland, Ohio

Richard Bryan
Indian Health Service
Health Services Administration

Dawn Bryan
American Heart Association
Dallas, Texas

Elsworth R. Buskirk, Ph.D.
Laboratory for Human Performance Research
Pennsylvania State University

Earl B. Byrne, M.D.
Bryn Mawr, Pennsylvania

Harry P. Cain, II, Ph.D.
American Health Planning Association

Antonio Calarco
Butte County Department of Health
Chico, California

David Calkins, M.D.
Office of the Secretary
Department of Health and Human Services

C. Wayne Callaway, M.D.
Nutrition Coordinating Committee
U.S. Public Health Service

Joseph Cameron
National Highway Traffic Safety Commission
U.S. Department of Transportation

Miriam M. Campbell, M.P.H.
Health Education Consultant
Orono, Maine

Richard Carleton, M.D.
The Memorial Hospital
Pawtucket, Rhode Island

Paula L. Carney
Food and Nutrition Service
U.S. Department of Agriculture

Charlotte Catz, M.D.
National Institute of Child Health and Human Development
National Institutes of Health

Dewey Cederblade
American Social Health Association

Don B. Chaffin, Ph.D.
Industrial and Operation Engineering
University of Michigan

Daniel Chatfield
Ohio Department of Health

*James Chin, M.D.
California Department of Health Services

William B. Cissell, Ph.D.
School of Public and Allied Health
East Tennessee State University

Ray A. Ciszek, Ed.D.
American Alliance for Health, Physical Education, and Recreation

James W. Clark, Jr.
American Optometric Association
Washington, D.C.

Linda Clemmings
American Public Health Association

Carl F. Coffelt, M.D.
County Health Department
Los Angeles, California

Dennis L. Colacino, Ph.D.
PepsiCo, Incorporated

Valerie Coleman
Heritage Conservation and Recreation Service
U.S. Department of the Interior

Durward R. Collier, D.D.S., M.P.H.
Department of Public Health
State of Tennessee

Gere Collosky
Blue Cross and Blue Shield
Chicago, Illinois

Bonnie A. Connors
American College of Obstetricians and Gynecologists

C. Carson Conrad
The President's Council on Physical Fitness and Sports

James P. Cooney, Jr., Ph.D.
Office of the Center Director
National Center for Health Statistics

John A.D. Cooper, M.D.
Association of American Medical Colleges

Claire M. Coppage, R.N., M.P.H.
Bureau of Training
Center for Disease Control

Robert D. Corwin, M.D.
American Heart Association

Audrey Cross
Office of the Secretary
U.S. Department of Agriculture

Jeffrey F. Cross
National Environmental Health Association and Ferris State College

*James W. Curran, M.D.
Bureau of State Services
Center for Disease Control

Russell W. Currier, D.V.M.
Division of Disease Prevention
Iowa Department of Health

Irvin M. Cushner, M.D.
U.S. Public Health Service

David A. Dammann
ACTION

Suzanne Dandoy, M.D., M.P.H.
Arizona Department of Health Services

Helen Darling
Institute of Medicine
National Academy of Sciences

Robert M. Daugherty, Jr., M.D.
Subcommittee on Smoking
American Heart Association

Ann Davis, R.N., B.S.N.
Overlook Hospital
Summit, New Jersey

Runyan Deere, Ph.D.
Cooperative Extension Service
University of Arkansas

John B. DeHoff, M.D., M.P.H.
Health Department
City of Baltimore

Sarah L. Diamond
Bureau of Health Education
Center for Disease Control

Gene Dickey
Food and Nutrition Service
U.S. Department of Agriculture

Ernest M. Dixon, M.D.
Celanese Corporation

*Ronald D. Dobbin
National Institute for Occupational Safety and Health
Center for Disease Control

Jane Dolkart, J.D.
Division of Advertising Practices
Federal Trade Commission

Charles L. Donahue, Jr.
Center for Health Planning
Boston University

Susan E. Donald
Bureau of Training
Center for Disease Control

Deborah Drudge, Esq.
Healthy America
Washington, District of Columbia

James M. Dunning, D.D.S., M.P.H.
Massachusetts Citizens' Committee for Dental Health

Robert L. DuPont, M.D.
Institute for Behavior and Health, Inc.
Bethesda, Maryland

Merlin K. Duval, M.D.
National Center for Health Education
San Francisco, California

Lucy Eddinger
Office of Adolescent Pregnancy Programs
U.S. Public Health Service

Robert Edelman, M.D.
National Institute of Allergy and Infectious Diseases
National Institutes of Health

Mary Egan, R.D., M.S., M.P.H.
Program Office for Maternal and Child Health
Health Services Administration

*Robert S. Eliot, M.D.
Cardiovascular Center
The University of Nebraska Medical Center

Effie O. Ellis, M.D.
American Medical Association and National Founadtion
March of Dimes

Mary Enig
Department of Chemistry
University of Maryland

James H. Erickson, M.D., M.P.H.
Bureau of Medical Services
Health Services Administration

Caswell Evans, D.D.S.
Seattle-King County Department of Public Health

Beth Ewy
Division of Cancer Prevention
Baltimore, Baryland

Ivan J. Fahs, Ph.D.
Rural Sociologist
Rochester, Minnesota

Robert C. Faine, D.D.S.
Bureau of State Services
Center for Disease Control

Henry A. Falk, M.D.
Bureau of Epidemiology
Center for Disease Control

Gerald Feck
Burn Injury Control Program
New York State Department of Health

Charles E. Feigley, M.D.
School of Public Health
University of South Carolina

Yehudi M. Feldman, M.D.
Bureau of Venereal Disease Control
City of New York Department of Health

Barry Felrice
National Highway Traffic Safety Administration
U.S. Department of Transportation

Joe Fenwick, D.D.S.
Health Planning Association of Northwest Ohio

Bernice Ferguson, R.N., M.P.H.
Department of Health
State of New Jersey

Harry L. Ferguson, M.D., Ph.D.
Science and Education Administration—Extension
U.S. Department of Agriculture

Conrad P. Ferrara
Bureau of Training
Center for Disease Control

Claudia E. Finney, M.T. (ASCP)
Saint Elizabeth's Hospital
Washington, District of Columbia

John R. Fleming
School of Allied Health
Ferris State College

Gordon Flint
Bureau of Health Education
Center for Disease Control

Dee Flynn
Bureau of Alcohol, Tobacco, and Firearms
U.S. Department of the Treasury

Peter Fraleigh
Health Planning Association of Northwest Ohio

Herman M. Frankel, M.D.
Health Services Research Center
Kaiser Foundation Hospitals

Todd M. Frazier
National Institute for Occupational Safety and Health
Center for Disease Control

Jack Friel
Bureau of Epidemiology
Center for Disease Control

Wendy Frosh, M.S.
Union Hospital
Lynn, Massachusetts

Lois W. Gage, Ph.D.
Medical School
The University of Michigan

George Galasso, Ph.D.
National Institute of Arthritis and Metabolic Diseases
National Institutes of Health

Judy Gartin, R.D.
Georgia State University
Atlanta, Georgia

Kristine M. Gebbie
Health Division
State of Oregon

Stephen D. Gelineau, APR
Union Hospital
Lynn, Massachusetts

Elizabeth C. Giblin
University of Washington
Seattle, Washington

Dottie Gillon, R.N., F.P.N.P.
Division of Health
Nevada Department of Human Resources

Charles Gish, D.D.S.
Indiana State Board of Health

Virginia M. Gladney, R.D., M.P.H.
Department of Health Services
County of Los Angeles

David Glasser, M.D., M.P.H.
Bureau of Disease Control
Baltimore, Maryland

Edwin M. Gold, M.D.
Women and Infants Hospital
Providence, Rhode Island

Willis B. Goldbeck
Washington Business Group on Health
Washington, D.C.

Frank Goldsmith, M.P.H.
New York State School of Industrial and Labor Relations
Cornell University

Jan Richard Goldsmith, D.M.D.
U.S. Public Health Service
Region II

Aurel Goodwin, Ph.D.
Mine Safety and Health Administration
U.S. Department of Labor

Janice Gordon
Food and Beverages Trades Department
AFL-CIO

Millicent Gorham
Office of the Honorable Louis Stokes
U.S. House of Representatives

Deane F. Gottfried, M.D.
Northern California Cancer Program
Palo Alto, California

Stanley N. Graven, M.D.
Department of Pediatrics and OB-GYN
University of South Dakota

Gareth M. Green, M.D.
Department of Environmental Health Sciences
Johns Hopkins University

Lawrence W. Green, Dr.P.H.
Office of Health Information, Health Promotion and
Physical Fitness and Sports Medicine
U.S. Public Health Service

Kenneth Greenspan, M.D.
College of Physicians and Surgeons
Columbia University

Joel R. Greenspan, M.D.
Bureau of Epidemiology
Center for Disease Control

Roy Griffin
Texas Area V Health Systems Agency, Inc.
Irving, Texas

Billy G. Griggs
Bureau of Health Education
Center for Disease Control

Stephen Grossman, J.D.
V.A. Scholars Program
Washington, District of Columbia

Susan R. Guarnieri
Baltimore City Health Department

Dale Hahn
Blue Cross and Blue Shield
Chicago, Illinois

Thomas J. Halpin, M.D., M.P.H.
Bureau of Preventive Medicine
Ohio Department of Health

Lee Hand, M.D.
VA Medical Center
Decatur, Georgia

Jean H. Hankin, Dr.P.H.
School of Public Health
University of Hawaii at Manoa

Dea Hanson, R.D.
Georgia State University
Atlanta, Georgia

Robert L. Harrington, M.D.
Permanente Medical Group
San Jose, California

Jeffrey E. Harris, M.D., Ph.D.
Department of Economics
Massachusetts Institute of Technology

Michael J. Hartford
School of Nursing
Georgetown University

L. Howard Hartley, M.D.
Committee on Exercise
American Heart Association

William L. Haskell, Ph.D.
School of Medicine
Stanford University

Dale Hattis, Ph.D.
Massachusetts Institute of Technology

Patricia Hausman, M.S.
Center for Science in the Public Interest
Washington, D.C.

Stephen W. Havas, M.D.
National Heart, Lung, and Blood Institute
National Institutes of Health

Victor M. Hawthorne, M.D.
School of Public Health
University of Michigan

Maxine Hayes, M.D.
Hinds-Rankin Urban Health Innovation Project
Brandon, Massachusetts

*Clark W. Heath, Jr., M.D.
Bureau of Epidemiology
Center for Disease Control

Mark Hegsted
Science and Education Administration
U.S. Department of Agriculture

Herman A. Hein, M.D.
Iowa Perinatal Program
The University of Iowa Hospitals and Clinics

Victor Herbert, M.D., J.D.
SUNY Downstate Medical Center and Bronx VA
Medical Center

M. Ward Hinds, M.D., M.P.H.
Cancer Center of Hawaii
University of Hawaii at Manoa

*Alan R. Hinman, M.D.
Bureau of State Services
Center for Disease Control

Robert S. Hockwald, M.D.
American Occupational Medical Association
Chicago, Illinois

Hap Hodd
Office of the Assistant Secretary for Management
and Budget
Department of Health and Human Services

Barbara Holloway
Bureau of Epidemiology
Center for Disease Control

Debbie Holman, R.N.
Outpatient Clinic
Center for Disease Control

Priscilla B. Holman
Bureau of Health Education
Center for Disease Control

King K. Holmes, M.D., Ph.D.
U.S. Public Health Service Hospital
—Seattle and University of Washington

Frank M. Hoot
Environmental Health
Baltimore, Maryland

Joann Horai, Ph.D.
American Psychological Association

Thomas J. Horne
Bureau of State Services
Center for Disease Control

Arthur E. Hoyte, M.D.
Department of Health Affairs
Washington, D.C.

Susan Hubbard
Georgia State University
Atlanta, Georgia

Sara M. Hunt, Ph.D.
Georgia State University
Atlanta, Georgia

*Robert Hutchings
Office on Smoking and Health
U.S. Public Health Service

James N. Hyde, M.P.H.
Division of Preventive Medicine
Massachusetts Department of Public Health

Robert Isman, D.D.S., M.P.H.
Dental Health Services
Multomah County, Oregon

Jack Jackson
Bureau of State Services
Center for Disease Control

George J. Jackson, Ph.D.
Division of Nutrition
Food and Drug Administration

Andrew B. James, M.S., Dr. P.H.
Department of Public Health
City of Houston

Ronnie S. Jenkins
Georgia Department of Human Resources

Robert E. Johnson, M.D.
Bureau of State Services
Center for Disease Control

Lloyd D. Johnston, Ph.D.
Institute for Social Research
The University of Michigan

Steven Jonas, M.D.
School of Medicine
State University of New York at Stoney Brook

Stephen B. Jones (Retired)
Missouri Department of Social Services
State of Missouri

Barbara L. Kahn
Department of Human Resources
State of North Carolina

John T. Kalberer, Jr., Ph.D.
Office of the Director
National Institutes of Health

Norman M. Kaplan, M.D.
The University of Texas Health Science
Center at Dallas

Snehendu B. Kar, Dr. P.H.
Center for Health Sciences
University of California, Los Angeles

Stanislav V. Kasl, Ph.D.
School of Medicine
Yale University

Judith Katz
National Foundation March of Dimes

Abraham J. Kauver, M.D.
Denver Department of Health and Hospitals

Mark Keeney
Department of Chemistry
University of Maryland

James A. Keith
School of Public Health
University of South Carolina

Bruce C. Kelley, Ph.D.
Department of Health
Providence, Rhode Island

Douglas Kellogg, Ph.D.
Bureau of Laboratories
Center for Disease Control

Lorin E. Kerr, M.D.
Department of Occupational Health
United Mine Workers of America

Samuel Kessel, M.D.
U.S. Public Health Service

Anne Kiefhaber, B.S.N.
Washington Business Group on Health
Washington, D.C.

Major John E. Killeen
Office of the Assistant Secretary of Defense
(Health Affairs)
Department of Defense

James R. Kimmey, M.D.
Midwest Center for Health Planning
Madison, Wisconsin

Stephen H. King, M.D.
Division of Health Sciences
PHS Regional Office (Atlanta)

George M. Kingman
National Institute of Environmental Health Sciences
National Institutes of Health

Robert J. Kingon
Bureau of State Services
Center for Disease Control

Janie Ann Kinney, J.D.
Blum and Nash
Washington, D.C.

Ardine Kirchhofer
Georgia State University
Atlanta, Georgia

John Kirscht, Ph.D.
School of Public Health
University of Michigan

Lawrence A. Klapow, Ph.D.
State Water Resources Control Board
State of California

Stuart A. Kleit, M.D.
National Kidney Foundation

John J. Klumb
Department of Education
State of California

Ruth N. Knollmueller, R.N., M.P.H.
School of Nursing
Yale University

Sam Knox
American Social Health Association

Dieter Koch-Weser, M.D.
Department of Preventive and Social Medicine
Harvard Medical School

Ross L. Koeser
U.S. Consumer Product Safety Commission

Roz Kohn
Baltimore City Health Department

Lloyd J. Kolbe, Ph.D.
National Center for Health Education

Gretchen Kolsrud, Ph.D.
Office of Technology Assessment
U.S. Congress

John M. Korn
Bureau of Health Education
Center for Disease Control

Paul Kotin, M.D.
Johns-Manville Corporation

Mary Grace Kovar
National Center for Health Statistics
U.S. Public Health Service

David P. Kraft, M.D.
University Mental Health Service
University of Massachusetts

Dorine G. Kramer, M.D.
Bureau of Health Education
Center for Disease Control

Helen Krause, M.P.H.
District V Health Department
Twin Falls, Idaho

Kathtleen Kreiss, M.D.
Bureau of Epidemiology
Center for Disease Control

Lawrence J. Krone, Ph.D., R.S.
National Environmental Health Association

W. Stanley Kruger
U.S. Office of Education

Saul Krugman, M.D.
Department of Pediatrics
New York University Medical Center

F. A. Kummerow
College of Agriculture
University of Illinois at Urbana-Champaign

Katherine Lacy
Office of Disease Prevention and Health Promotion

Robert E. Lamb, D.D.S.
Council on Dental Health and Health Planning
American Dental Association

Louis C. LaMotte, Sc.D.
Bureau of Laboratories
Center for Disease Control

J. Michael Lane, M.D.
Bureau of Smallpox Eradication
Center for Disease Control

Herbert G. Langford, M.D.
The University of Mississippi Medical Center

Laurent P. LaRoche, M.D.
Western Electric Company

Judith H. LaRosa, R.N., M.N.Ed.
National Heart, Lung, and Blood Institute
National Institutes of Health

Dolores Lemon
Joint Commission on Accreditation of Hospitals

John D. Lenton, M.D.
VA Medical Center
Decatur, Georgia

Carl Leukefeld, Ph.D.
Division of Resource Development
National Institute on Drug Abuse

Cora S. Leukhart
Bureau of State Services
Center for Disease Control

Gilbert A. Leveille
Department of Food Science and Human Nutrition
Michigan State University

Richard A. Levinson, M.D.
Veterans Administration

Richard Light, M.D.
Indian Health Service
Health Services Administration

Marc B. Lipton, Ph.D., M.P.A.
Mental Health and Addictions
City of Baltimore Health Department

*Frank S. Lisella, Ph.D.
Bureau of State Services
Center for Disease Control

J. William Lloyd, Sc.D.
Occupational Safety and Health Administration
U.S. Department of Labor

Keith R. Long, Ph.D.
College of Medicine
University of Iowa

Katherine S. Lord
Office of Information
Center for Disease Control

Cliff E. Lundberg
National Headquarters for American Red Cross

Karen M. Lynch
South Carolina Department of Health and Environmental Control

John C. MacQueen, M.D.
Department of Pediatrics
University of Iowa

George F. Mallison, M.P.H.
Bureau of Epidemiology
Center for Disease Control

Arnold M. Malmon
Milwaukee Blood Pressure Program
Milwaukee, Wisconsin

Robert B. Mancke
Bureau of Health Education and Information
City of Baltimore Health Department

Edgar K. Marcuse, M.D.
Children's Orthopedic Hospital and Medical Center/
Seattle

Louise Markley
American Public Health Association

Russell (Bud) Mason
Indian Health Service
Health Services Administration

James O. Mason, M.D., Dr. P.H.
Utah State Department of Health

Kathleen A. McBurney, R.D., M.P.H.
Department of Human Resources
State of Nevada

Jermyn F. McCahan, M.D.
Department of Environmental, Public and Occupational
Health
American Medical Association

David B. McCallum, Ph.D.
South Carolina Department of Health and Environmental
Control

John J. McCarthy, Jr., M.D.
National Family Planning Federation of America

Roger McClain
Indiana State Board of Health

William M. McCormack, M.D.
Massachusetts State Laboratory Institute

William J. McCurry
Division of Preventive Health Services
Public Health Service Region IX

Philip R.B. McMaster, M.D.
Bureau of Laboratories
Center for Disease Control

Simon A. McNeeley
Bureau of Elementary and Secondary Education
U.S. Office of Education

Donald McNellis, M.D.
Bureau of Community Health Services
Health Services Administration

Kristen W. McNutt, Ph.D.
National Nutrition Consortium, Inc.

Robert Mecklenburg, D.D.S.
Indian Health Service
Health Services Administration

Antonio S. Medina, M.D., M.P.H.
School of Public Health
University of California, Berkeley

Marie C. Meglen, M.S., C.N.M.
Department of Health and Environmental Control
State of South Carolina

Harold R. Metcalf
Drug Enforcement Administration
Department of Justice

Anna Cay Milfeit
Health Systems Agency
Pittsburgh, Pennsylvania

Nancy Milio, Ph.D.
School of Nursing
The University of North Carolina at Chapel Hill

Joan M. Miller
Program Development Department
Blue Cross & Blue Shield Associations

*C. Arden Miller, M.D.
School of Public Health
University of North Carolina

Anita Mills
Office of Dental Affairs
U.S. Public Health Service

Lloyd Millstein, Ph.D.
Food and Drug Administration

Jane Mitcham
School of Public Health
University of South Carolina

J. Henry Montes
Office of Disease Prevention and Health Promotion

Debby Moore
Region IV—ACTION

*Lenora Moragne, Ph.D.
Nutrition Coordinating Office
Department of Health and Human Services

Douglas H. Morgan, M.P.A.
Department of Health and Welfare
City of Newark

Gary E. Morigeau
Indian Health Service
Health Services Administration

Naomi M. Morris, M.D.
University of Health Sciences
The Chicago Medical School

Robert F. Murphy
Sierra Club (New England)

Clayton R. Myers, Ph.D.
National Board of YMCAs
New York, New York

Kitty Naing, M.D.
Bureau of Community Health Services
Health Services Administration

Rose Navarro
American Public Health Association
Washington, D.C.

Larry Needham, Ph.D.
Bureau of Laboratories
Center for Disease Control

Jane W. Neese, Ph.D.
Bureau of Laboratories
Center for Disease Control

Mark Nelson, M.D.
Bureau of Epidemiology
Center for Disease Control

Elaine Nemoto
American Public Health Association
Washington, D.C.

*Robert O. Nesheim, Ph.D.
The Quaker Oats Company

Stephen H. Newman, Ed.D.
Charlotte Drug Education Center
Charlotte, North Carolina

Ervin E. Nichols, M.D., FACOG
The American College of Obstetricians and Gynecologists
Washington, D.C.

Patricia K. Nicol, M.D.
Department for Human Resources
Commonwealth of Kentucky

Elena O. Nightingale, M.D., Ph.D.
Institute of Medicine
National Academy of Sciences

Joel L. Nitzkin, M.D.
Monroe County Department of Health
Rochester, New York

Arthur Norris
National Center for Toxicological Research
Food and Drug Administration

Cynthia Northrop, R.N., M.S., J.D.
Community Health Nursing
University of Maryland

Helen H. Nowlis, Ph.D.
Office of School Health
U.S. Office of Education

Patricia O'Gorman
National Institute on Alcohol Abuse and Alcoholism
Alcohol, Drug Abuse, and Mental Health Administration

Godfrey Oakley, M.D.
Bureau of Epidemiology
Center for Disease Control

Robert E. Olson, M.D.
School of Medicine
St. Louis University Medical Center

Gilbert S. Omenn, M.D.
Office of Management and Budget
Executive Office of the President

Edward O. Oswald
School of Public Health
University of South Carolina

Elizabeth Owen
Heritage, Conservation, and Recreation Service
U.S. Department of the Interior

Fran Owen, M.P.H.
South Carolina Department of Health and Environmental Control

George M. Owen, M.D.
School of Public Health
University of Michigan

Richard L. Parker, D.V.M., M.P.H.
Bureau of Epidemiology
South Carolina Department of Health and Environmental Control

Russ Pate
School of Public Health
University of South Carolina

Linwood J. Pearson, M.D.
Department of Health
Commonwealth of Pennsylvania

A.M. Pearson
Department of Food Science and Human Nutrition
Michigan State University

Terry F. Pechacek, Ph.D.
School of Public Health
University of Minnesota

Barbara Perman
Yale University

*Thomas F. A. Plaut, Ph.D.
National Institute of Mental Health
National Institutes of Health

Richard N. Podell, M.D., M.P.H.
Overlook Family Practice Association
Overlook Hospital (Summit, NJ)

Michael R. Pollard
Office of Policy Planning and Evaluation
Federal Trade Commission

Marion B. Pollock, Ed.D.
Department of Health Science
California State University

Lawrence E. Posey
Bureau of Health Education
Center for Disease Control

E. Charlton Prather, M.D.
Department of Health and Rehabilitative Services
State of Florida

Richard A. Prescott
Health Systems Agency of South Central Connecticut

Shirley S. Preston
American Cancer Society

James H. Price, Ph.D., M.P.H., FASHA
Department of Health and Safety Education
Kent State University

Jeanne M. Priester
U.S. Department of Agriculture

Milton Puziss, Ph.D.
National Institute of Allergy and Infectious Diseases
National Institutes of Health

David L. Rabin, M.D., M.P.H.
Georgetown University School of Medicine
Washington, D.C.

David E. Raley
Directorate of Aerospace Safety
Department of Defense

John Rankin, M.D.
School of Medicine
University of Wisconsin

Gil Ratcliff, Jr., M.D.
West Virginia Committee for Perinatal Health

H. Dickinson Rathbun
Christian Science Committee on Publications
Boston, Massachusetts

Elizabeth B. Rawlins
Simmons College

William E. Rawls, M.D.
Department of Pathology
McMasters University

Jack Recht
National Safety Council

James Q. Regnier
Blue Cross and Blue Shield of Minnesota

*Robert L. Retka
National Institute on Drug Abuse
U.S. Public Health Service

Gladys H. Reynolds, Ph.D.
Bureau of State Services
Center for Disease Control

Y.B. Rhee
U.S Public Health Service, Region VII

Anne M. Rhome, M.P.H., R.N.
American Nurses' Association
Houston, Texas

Gina Ries, R.D.
Iowa State Department of Health

Elizabeth W. Riggs, R.N., CNM
Georgia Department of Human Resources
Atlanta, Georgia

Adonna A. Riley
Commission on Health and Welfare
National PTA

David Rimland, M.D.
V.A. Medical Center
Decatur, Georgia

William P. Ringo, Ph.D.
Birmingham Regional Health Systems Agency
Birmingham, Alabama

Hania W. Ris, M.D.
Department of Pediatrics
University of Wisconsin Medical School

Sherrill W. Ritter, Jr.
Office of Human Development Services
Department of Health and Human Services

Hilda H. Robbins
Mental Health Association
Arlington, Virginia

Frances T. Roberts
Office of Child Day Care
State of Connecticut

Susan Roberts, R.D.
Iowa State Department of Health

H. Clay Roberts
Educational Service District #121
Seattle, Washington

Jack Robertson, D.D.S.
Office of Dental Affairs
U.S. Public Health Service

Donald H. Robinson, M.D.
South Carolina Department of Health and Environmental Control

Edward Roccella, Ph.D.
National Heart, Lung, and Blood Institute
National Institutes of Health

Roger W. Rochat, M.D.
Bureau of Epidemiology
Center for Disease Control

Ava Rodgers, Ph.D.
Science and Education Administration—Extension
U.S. Department of Agriculture

Maria L. Rodriguez
Guadalupe Family Health Clinic
Toledo, Ohio

Milton I. Roemer, M.D.
School of Public Health
University of California, Los Angeles

Vincent C. Rogers, D.D.S., M.P.H.
Bureau of Dental Care

William N. Rom, M.D., M.P.H.
College of Medicine
University of Utah

*Judith P. Rooks
Office of Population Affairs
U.S. Public Health Service

William L. Roper, M.D.
Jefferson County Health Department
Birmingham, Alabama

Patricia F. Roseleigh, R.D., M.S.
Indian Health Service
Health Services Administration

Gerald Rosenthal, Ph.D.
National Center for Health Services Research

John Roskis, Pharm. D.
Mercer University Southern
Atlanta, Georgia

Jeannie I. Rosoff
Alan Guttmacher Institute

Sheldon Rovin, D.D.S., M.S.
V.A. Scholars Program
Washington, D.C.

George Rubin, M.D.
Bureau of Epidemiology
Center for Disease Control

David D. Rutstein, M.D.
Countway Library
Harvard University

Ronald K. St. John, M.D.
Bureau of State Services
Center for Disease Control

James H. Sammons, M.D.
American Medical Association
Chicago, Illinois

Joseph Sampugna
Department of Chemistry
University of Maryland

Anthony V. Sardinas, M.A., M.P.H.
Office of Public Health
State of Connecticut

Roger Sargent
School of Public Health
University of South Carolina

John W. Scanlon, M.D.
Columbia Hospital for Women
Washington, D.C.

William Schaffner, M.D.
Departments of Medicine and Preventive Medicine
Vanderbilt University Hospital

Renee Schick
Capital Systems Group
Rockville, Maryland

Roger Schmidt
American Lung Association

Stephen C. Schoenbaum, M.D.
Peter Bent Brigham Hospital
Boston, Massachusetts

James A. Schoenberger, M.D.
Rush-Presbyterian-St. Luke's Medical Center
Chicago, Illinois

Marc Schuckit, M.D.
Veterans Administration Hospital
San Diego, California

Myron G. Schultz, M.D.
Bureau of Epidemiology
Center for Disease Control

Catherine Schutt, R.N., M.S.
Union Hospital
Lynn, Massachusetts

Barbara Scott, R.D., M.P.H.
Division of Health
Nevada Department of Human Resources

Robert H. Selwitz, D.D.S., M.P.H.
Region III
Department of Health and Human Services

John C. Sessler, Ph.D.
Office of Health Planning and Evaluation
U.S. Public Health Service

Iris R. Shannon, R.N., M.S.
American Public Health Association

Alvin P. Shapiro, M.D.
Department of Medicine
University of Pittsburgh School of Medicine

Marion Sheehan
Metropolitan Life

Susan B. Shelton
Bureau of Training
Center for Disease Control

Cecil Sheps, M.D.
Health Services Research Center
University of North Carolina

Edward Shmunes
School of Public Health
University of South Carolina

Clyde E. Shorey, Jr.
The National Foundation March of Dimes

Naseeb L. Shory, D.D.S.
Bureau of Dental Health
Alabama Department of Public Health

Carole J. Sieverson
Metropolitan Health Board
St. Paul, Minnesota

Artemis P. Simopoulos, M.D.
Nutrition Coordinating Committee
National Institutes of Health

Louis Slesin, Ph.D.
Natural Resource Defense Council

John Scott Small
National Institute of Dental Research
National Institutes of Health

Jessie M. Smallwood
Health Systems Agency, Inc.
New Orleans, Louisiana

Johnnie W. Smith
South Carolina Department of Health and Environmental Control

*W. McFate Smith, M.D.
Department of Medicine
University of California at San Francisco

Roy G. Smith, M.D.
School of Public Health
Univeresity of Hawaii at Manoa

James M. Sontag, Ph.D.
National Cancer Institute
National Institutes of Health

Harrison C. Spencer, M.D.
Bureau of Tropical Diseases
Center for Disease Control

Dick Spruyt, M.D.
Division of Health Services
North Carolina Department of Human Resources

Harry Staffileno, Jr., D.D.S.
The American Academy of Periodontology

Rose Stamler
The Medical School
Northwestern University

Charles S. (Jack) Stanley
Bureau of Training
Center for Disease Control

Fredrick J. Stare, M.D.
School of Public Health
Harvard University

William B. Stason, M.D.
School of Public Health
Harvard University

Chedwah J. Stein, M.S., R.D.
Nutrition Unit
Oregon State Health Division

Jeanne M. Stellman, Ph.D.
Women's Occupational Health Resource Center
American Health Foundation

Pauline G. Stitt, M.D.
School of Public Health
University of Hawaii at Manoa

T. Wayne Stott
National Family Planning and Reproductive Health Association

Angela Strickland
American Public Health Association

David F. Striffler, D.D.S.
School of Public Health
University of Michigan

Phyllis E. Stubbs, M.D.
Baltimore City Health Department

A. T. Sturdivant
Atlanta Area Office
Consumer Product Safety Commission

Mary E. Sullivan
Bureau of Health Education
Center for Disease Control

Jim Summers
Metairie, Louisiana

John David Suomi, D.D.S.
Office of Dental Affairs
U.S. Public Health Service

Juris M. Svarcberg, D.M.D., M.P.H.
Henry J. Austin Health Center
Trenton, New Jersey

*Glen Swengros
President's Council on Physical Fitness and Sports

Donald A. Swetter, M.D.
Indian Health Service
Health Services Administration

C. Barr Taylor, M.D.
Department of Psychiatry and Behavior Science
Stanford Medical Center

L. David Taylor
Office of the Secretary
Department of Health and Human Services

Andy Tepper-Rasmussen
Oklahoma Health Systems Agency, Inc.

Stephen Teret, J.D.
School of Hygiene and Public Health
Johns Hopkins University

*Stephen Thacker, M.D.
Bureau of Epidemiology
Center for Disease Control

Caroline B. Thomas, M.D.
School of Medicine
Johns Hopkins University

Flora L. Thong
Department of Health
State of Hawaii

Hugh H. Tilson, M.D.
North Carolina Division of Health Services

Marian Tompson
La Leche League International

Carl W. Tyler, Jr., M.D.
Bureau of Epidemiology
Center for Disease Control

Louise B. Tyrer, M.D.
Planned Parenthood Federation of America, Inc.

John E. Vanderveen, Ph.D.
Division of Nutrition
Food and Drug Administration

Betty Vanta, R.D.
Georgia State University
Atlanta, Georgia

Jamese D. Vargo, M.D.
VA Medical Center
Decatur, Georgia

*Tom M. Vernon, M.D.
Colorado Department of Health

Murray Vincent
School of Public Health
University of South Carolina

John R. Viren, Ph.D.
Office of Health and Environmental Research
U.S. Department of Energy

Frank J. Vocci, Ph.D.
Drug Abuse Staff
Food and Drug Administration

Thomas M. Vogt, M.D., M.P.H.
Kaiser Foundation Hospitals
Portland, Oregon

Jane Voicheck, Ph.D.
Science and Education Administration—Extension
U.S. Department of Agriculture

Hiawatha B. Walker, Ph.D.
School of Public and Allied Health
East Tennessee State University

Lawrence M. Wallack, M.S.
School of Public Health
University of California, Berkeley

Julian A. Waller, M.D.
Dpartment of Epidemiology and Environmental Health
University of Vermont Medical School

Elli Walters
Environmental Policy Institute

Virginia Li Wang, Ph.D.
School of Hygiene and Public Health
Johns Hopkins University

*Graham Ward
National Heart, Lung and Blood Institute
National Institutes of Health

Beverly G. Ware, Dr. P.H.
Ford Motor Company

Kenneth E. Warner, Ph.D.
School of Public Health
University of Michigan

*David H. Wegman, M.D.
School of Public Health
Harvard University

John H. Weisburger, Ph.D.
American Health Foundation
Naylor Dana Institute for Disease Prevention

Jerrold L. Wheaton, M.D.
Riverside County Health Department
Riverside, California

Patricia F. Whitmore, M.S.W.
Department of Mental Health/Mental Retardation
State of Tennessee

Paul J. Wiesner, M.D.
Bureau of State Services
Center for Disease Control

K.D. Wiggers
Iowa State University of Science and Technology

Charlotte Wilen
Select Panel for the Promotion of Child Health

Jean C. Wilford
Bureau of Training
Center for Disease Control

Jane Williams
Environmental Policy Institute

*Jack Wilmore, Ph.D.
Department of Physical Education and Athletics
University of Arizona

Ronald W. Wilson
Division of Analysis
National Center for Health Statistics

John J. Witte, M.D.
Bureau of Health Education
Center for Disease Control

Ilene Wolcott, Ma.Ed.
Women and Health Round Table
Washington, D.C.

Frederick S. Wolf, M.D.
Alabama Department of Public Health

Joan M. Wolle
Health Education Center
Maryland Department of Health and Mental Hygiene

George J. Wolnez, C.S.P., P.E.
Sanderson Safety Supply
Portland, Oregon

Sidney Wolverton
Division of Prevention
Alcohol, Drug Abuse, and Mental Health Administration

Catherline Woteki, Ph.D.
Office of Technology Assessment
U.S. Congress

William L. Yarber, HSD
Department of Health Education
Purdue University

Eleanor A. Young, Ph.D.
Department of Medicine
University of Texas Health Science Center

Steven Zifferblatt, Ph.D.
National Heart, Lung, and Blood Institute
National Institute of Health

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